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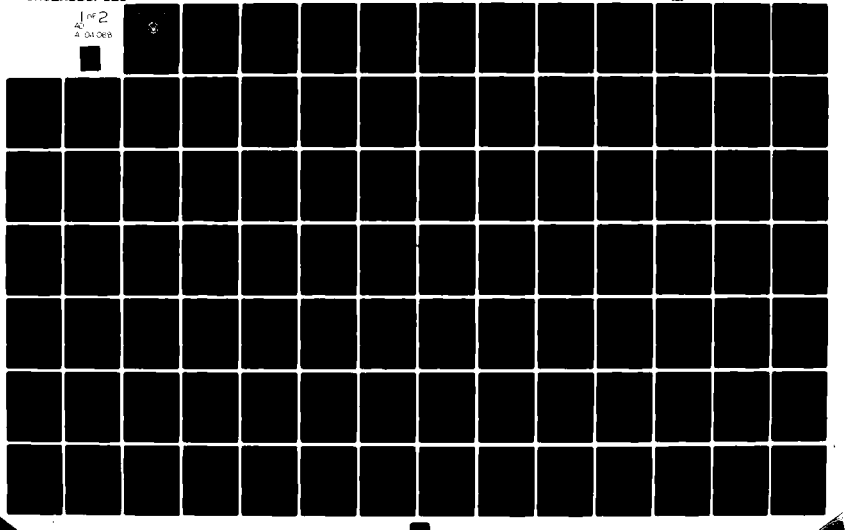

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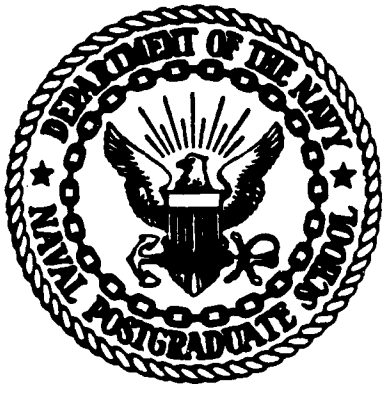

THESIS

PREPARING FOR PHASE II:

A GUIDE TO THE PAY/PERSONNEL ADMINISTRATIVE SUPPORT SYSTEM (PASS) SOURCE DATA SYSTEM (SDS) SITE PREPARATION PROCESS FOR PASS FIELD MANAGERS

by

Janet Elaine Craig

June 1981

Thesis Advisor: N. R. LYONS

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This thesis presents an initial orientation and general overview of the physical and managerial aspects of the field level site preparation process for the Source Data System (SDS), the automated distributed processing system which will implement Phase II of the Pay/Personnel Administrative Support System (PASS). It describes a systematic approach to terminal and printer requirements and allocation analysis, configuration design, and management of field level site preparation activities for a

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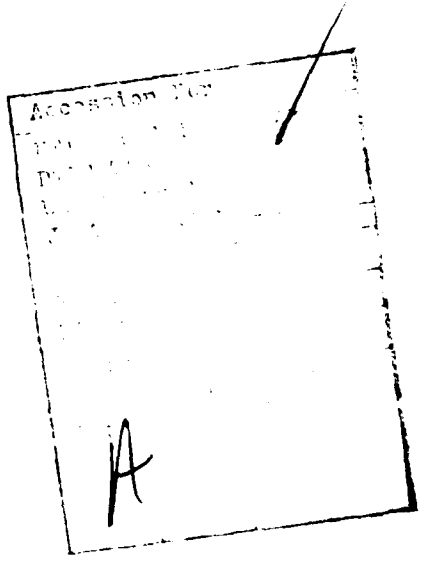
While the thesis specifically addresses the PASS/SDS system, the approach, forms and checklists developed could easily be adapted for use in supporting remote entry level site preparation involved in any distributed processing system.



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Preparing for Phase II:

A Guide to the Pay/Personnel Administrative Support System (PASS) Source Data System (SDS) Site Preparation Process For PASS Field Managers

by

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Submitted in partial fullfillment of the
requirements for the degree of

MASTER OF SCIENCE IN INFORMATION SYSTEMS

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ABSTRACT

This thesis presents an initial orientation and general overview of the physical and managerial aspects of the field level site preparation process for the Source Data System (SDS), the automated distributed processing system which will implement Phase II of the Pay/Personnel Administrative Support System (PASS). It describes a systematic approach to terminal and printer requirements and allocation analysis, configuration design, and management of field level site preparation activities for a selected configuration. Forms and checklists developed by the author to implement the approach are described and explained in the main body of the thesis and included as Appendices.

While the thesis specifically addresses the PASS/SDS system, the approach, forms and checklists developed could easily be adapted for use in supporting remote entry level site preparation involved in any distributed processing system.

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I. INTRODUCTION/SCOPE

A. INTRODUCTION

The Department of the Navy is currently in the process of developing the Pay/Personnel Administrative Support System (PASS) Source Data System (SDS), a distributed processing system of automated personnel, pay, and passenger transportation support which will dramatically and fundamentally change the methods and procedures utilized for reporting of field transactions to central authority. One of the most critical phases of the program, currently in the planning stages at the project level, is the coordinated implementation of the shore-based portion of the system within approximately 150 field level sites as well as approximately 15 intermediate field host processor sites and two centralized headquarters processing sites.

Successful coordination of the site preparation planning efforts for the new system faces three complicating factors:

1. The wide geographical dispersion of physical sites at which the system must be implemented;

2. The relative inexperience of field site managers regarding implementation planning requirements and considerations; and

3. The turnover of knowledgeable personnel which will occur during the implementation phase of the project.

The wide geographical dispersion of field sites makes it virtually impossible for the centralized project office to accurately specify schedules and perform site preparation activities for the entire network. Accordingly, project implementation will entail the requirement for the major portion of site preparation planning and coordination to be performed by the various field activities, with guidance, monitoring, and control from the central project office.

This dispersion of site preparation responsibility is further complicated by the fact that many, if not the majority, of PASS field managers have little or no experience with computer systems, much less with identifying the essential site preparation requirements, nor analyzing potential organizational impacts of decisions made during selection and planning process.

The third complicating factor, turnover of personnel, is inherent in any project within the military organizational environment. Maintenance of continuity of purpose and effort in developing and implementing a system within the dynamics of the military environment is, at best, a task requiring dedicated effort, and at worst, a near impossibility. Personnel in key positions and with varying responsibilities are often reassigned to new duties and are replaced by personnel with only the limited knowledge of responsibilities gleaned from the turnover process and any such documentation which was considered worthy of retention by predecessors.

This process of turnover and reorientation will occur quite frequently during the phased implementation of the system, which is scheduled to occur over a two-year period. While such discontinuity is an unavoidable situation within the military environment, it could easily have severe consequences on the schedule and successful coordination of implementation efforts.

This thesis is intended to assist in alleviating the potential adverse effects of the environment described above by providing incumbent and/or incoming PASS field managers an initial reference point and general overview of site preparation considerations and activities which will require detailed and specific analysis in coordination with the official SDS implementation plan being developed at the project level.

B. SCOPE

This thesis is intended as a supplement to official implementation planning guidelines promulgated by the PASS/SDS Project office. While overall SDS implementation planning will entail consideration of numerous elements and processes, including training, funding and budgeting requirements and procedures, conversion planning and procedures, field level/SDS Project Office responsibilities and communications/reporting procedures, this thesis focuses specifically on the physical and managerial aspects of the SDS site preparation process. It is intended for

use by those field managers who have little or no previous experience in planning for an automated data entry system--as an orientation to the site preparation considerations which may impact successful implementation at the field activity level.

As an orientation, Chapter II of the thesis provides a biref summary of the concept and background of the PASS Program, as well as a description of the SDS support areas, and the telecommunications network design of SDS.

Chapter III, Field Level Site Preparation Responsibilities and Activities, describes the general physical aspects and requirements which must be analyzed and coordinated at the field activity level to ensure proper physical facilities are available to support SDS implementation and operation.

Chapter IV identifies the general requirements and constraints which must be considered when planning SDS equipment allocation and configuration within the field activity.

Chapter V describes procedures for determining equipment allocation and terminal configuration within the activity.

Chapter VI describes the general site preparation activities which must be completed for a selected SDS configuration.

Chapter VII, Management of the Site Preparation Process, describes the management aspects which must be considered during the SDS Site Preparation Process.

The thesis concludes with Chapter VIII, Site Preparation and the Implementation Process, which describes the role of site preparation in the successful implementation of the SDS system at the field activity Level.

The contents of this thesis focus specifically upon the PASS/SDS program and project as related to support of regular Navy components serviced by shore-based PASS offices. While support of Reserve components is equally important, at the time research for this thesis was being conducted, the extent and timing of such support had not yet been specified and documented in sufficient detail for inclusion. However, the procedures and considerations presented could easily be extended to include Reserve support transaction analysis. In fact, many of the considerations described are relatively general in nature and would be applicable to the site preparation planning of any distributed processing system.

II. BACKGROUND/DESIGN

A. BACKGROUND

The Navy's Pay/Personnel Administrative Support System (PASS) is the result of efforts initiated by an Assistant Secretary of the Navy (Financial Management) memorandum issued in February, 1976, which established a flag-level steering group and working group to determine the feasibility of integrating personnel and pay functions in the Navy in order to improve pay and personnel services to Navy members and to increase the timeliness and accuracy of source data reported by field activities to the Navy Military Personnel Command (NMPC) and the Navy Finance Center (NFC) automated data bases. In 1977, the Chief of Naval Operations additionally included Navy passenger transportation services into the PASS concept and program. The resulting proposed system of support, PASS, was given approval for Navy-wide implementation by the Vice Chief of Naval Operations in October, 1978. [Ref. 1] Objectives of the PASS program include:

1. Establishment of a management organization for the improvement of military pay, military personnel, and all Navy-sponsored passenger transportation administration;

2. Establishment of a geographic network of consolidated offices organized, staffed, and trained to provide improved professional support in the three functional areas;

3. To provide one-stop customer service in the three functional areas;

4. To improve the accuracy and timeliness of pay and personnel data bases;

5. To improve the professionalism and efficiency of pay, personnel, and passenger transportation administrative personnel;

6. To automate the field reporting system of pay and personnel data;

7. To integrate and improve the management and administrative systems for the three functions; and

8. To realize personnel and financial economies. [Ref. 2]

Conversion to PASS entails a fundamental reorganization of the Navy's pay, personnel and transportation support system structure. The development of PASS includes three distinct phases of effort:

1. Consolidation and colocation of pay, personnel, and Navy-sponsored passenger transportation support into a new organizational structure based upon centralized support for geographic regions rather than support on an individual command basis;

2. Automation of field generated personnel and pay source data within the PASS network; and

3. Integration of military pay and personnel and passenger transportation support management systems into a single improved system.

Phase I of the PASS Program, consolidation and colocation, was initiated in 1977 and scheduled for completion in

1980. [Ref. 3] Prior to 1977, the three PASS functions were administered from separate headquarters and field organizations in physically-separated and functionally-diverse offices, encompassing over 3500 Navy personnel offices and 500 disbursing offices (ashore and afloat). [Ref 4] PASS Phase I involved the reorganization of pay, personnel, and passenger transportation support into a new management organization network. This reorganization involved the disestablishment of individual command personnel offices and transfer of personnel and disbursing support billets and personnel to newly established Personnel Support Activity Branches (PSBOs) and Detachments (PSDs), the basic field level offices of PASS network. Groups of Personnel Support Activity Detachments and Branches within a geographic region are in turn subordinate to a regional Personnel Support Activity (PSA), which has overall responsibility for support within a given geographic region. The regional Personnel Support Activities are subordinate to seven different major claimants, based either on geographic area or primary mission support responsibility area.

Phase II of the PASS Program is the development and implementation of an automated data system, designed to achieve PASS Program objective number six-automation of the field reporting system of pay and personnel data. The system being developed in support of this objective is the Source Data System (SDS). For shore-based activites, PASS/SDS will consist of a dedicated telecommunications network with

distributed local databases which will be linked to central personnel and pay databases to provide management information support as well as real-time data entry. For afloat units, SDS will operate on the Shipboard Nontactical Automated Data Processing System (SNAP) being developed separately under the sponsorship of the Chief of Naval Material. [Ref. 5]

Shore-based PASS/SDS, being developed under the co-sponsorship of the Chief of Naval Personnel and Navy Comptroller, is scheduled to commence field implementation in July, 1982, and will be implemented Navy-wide over a two-year period. [Ref. 6]

Phase III of the PASS Program, the integration and improvement of pay, personnel, and passenger transportation management systems, is intended to evolve from procedures developed in Phases I and II; therefore detailed objectives for implementation of Phase III have not yet been developed. [Ref. 7]

B. SDS SUPPORT AREAS

SDS is being developed and implemented in three phases in order to permit segmentation of software development, testing, and implementation into manageable units. [Ref. 8] Release 1 is therefore a subset of the functions planned for the complete SDS. Release 1 support, scheduled to begin with initial installation of system hardware in July, 1982, will include:

- event reporting for most personnel and pay data;

- two-way telecommunciation of information

- maintenance of local data bases;

- report generation capability;

- various local support capabilities;

- replacement of current word processing equipment with equal or more efficient word processing capability.

Release 2, scheduled for field implementation in the second quarter of 1984 will add the following support functions:

- payday processing and check printing capability

- on-line Leave and Earnings Statements

- transmission of daily pay computation data

- availability reporting

- interface with MILPERSIS II (CNET data base)

- passenger transportation reservation request support

- travel claim processing

- mass reporting of pay changes

Release 3, scheduled for implementation beginning in 1986, will provide support in the following areas:

- financial reporting and integration with the Integrated Disbrusing and Accounting System (IDA)

- PSD to PSD data flow capability

- field correction of headquarters-detected errors

SDS will replace many of the currently employed OCR forms and diary transactions with an on-line data entry system. A summary of currently used forms which will be

replaced by each Release of SDS is contained in Appendix A.

C. SDS NETWORK DESIGN

The SDS network design is a distributed processing and data base system divided into three primary levels:

1. Cathode Ray Tube (CRT) terminals, companion printers, and highspeed printing capability within the local Personnel Support Activity Branches and Detachments;

2. Minicomputer field host processors (FHPs) located within Naval Regional Data Automation Centers (NARDACs) and selected overseas sites which will support specified Personnel Support Acitvities within a geographic region and interface with headquarters master data bases; and

3. Headquarters host processing centers (HHPs) located at NMPC and NFC which maintain the centralized master pay and personnel data bases for the system.

CRT terminals and companion printers located within the individual Personnel Support Activity Branches and Detachments will be operated on-line via dedicated telecommunications lines to the field host processor located within the supporting NARDAC or processing center. The field host processors, minicomputers dedicated to SDS, will support PSD terminal control, local PASS/SDS applications, and PASS/SDS network functions. FHPs, in turn, will be on-line to the headquarters host-processors' master pay and personnel data bases. [Ref. 9] Diagrams of the SDS network design are

illustrated in Figures 1 through 5. Figure 1 depicts the overall SDS network design consisting of three network levels. Figure 2 depicts the detailed design of the Level 1 (NARDAC) network structure. Figure 3 depicts the Level 2 (PSA) network structure. Figure 4 and 5 depict the alternate Level 3 (PSD) network structures associated with the use of synchronous or asynchronous terminals, respectively. [Ref. 10]

D. SDS DATA FLOW DESIGN

All PASS transactions for update of headquarters master pay and personnel data bases will be input at the field offices through CRT terminals. Transactions will be edited on-line against the PASS mini-master database in the FHP at the supporting NARDAC. After field transactions have been updated, local fields will be held in suspense pending headquarters update processing. Such edited field transactions will be stored in a holding file in the FHP pending headquarters update actions, the frequency of which will be determined by the frequency of transactions submitted from the field and the frequency of headquarters update processing. Update of field data bases from headquarters will be provided within 24 hours, achieved by a batch update following the daily communications period. [Ref. 11]

In addition to PASS transaction support, data bases within the FHPs will contain a section of the data base

OVERALL SDS NETWORK DESIGN

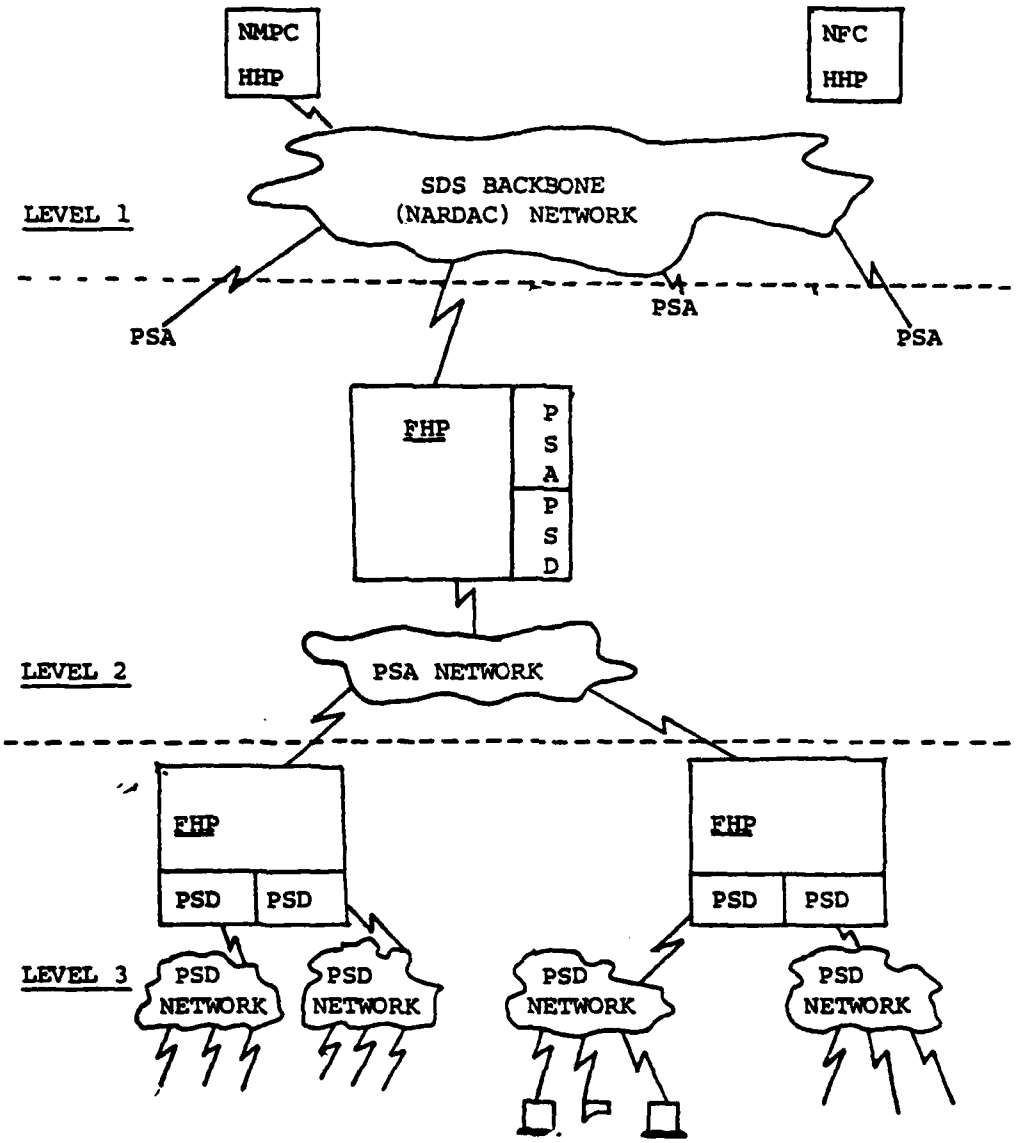


Fig. 1. Overall SDS Network Design.

LEVEL ONE--SDS BACKBONE (NARDAC) STRUCTURE

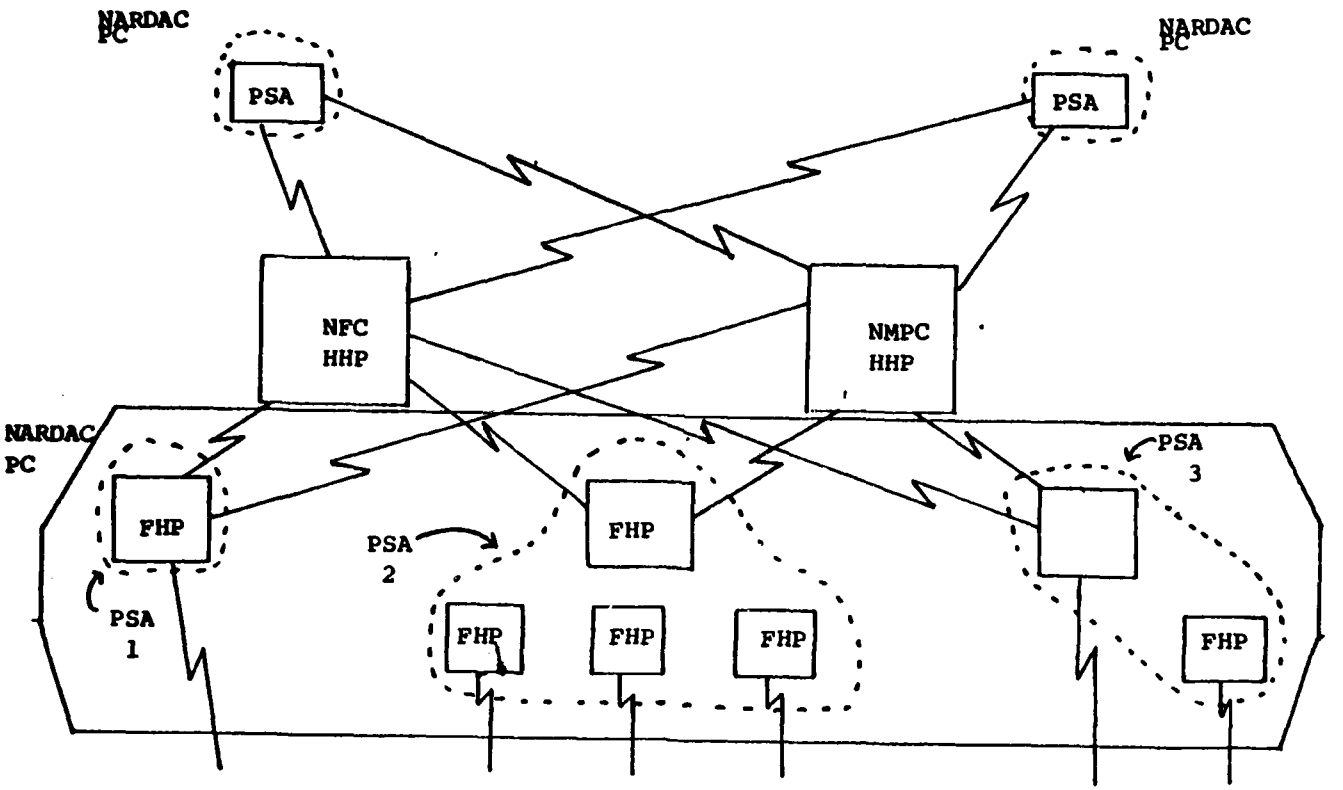
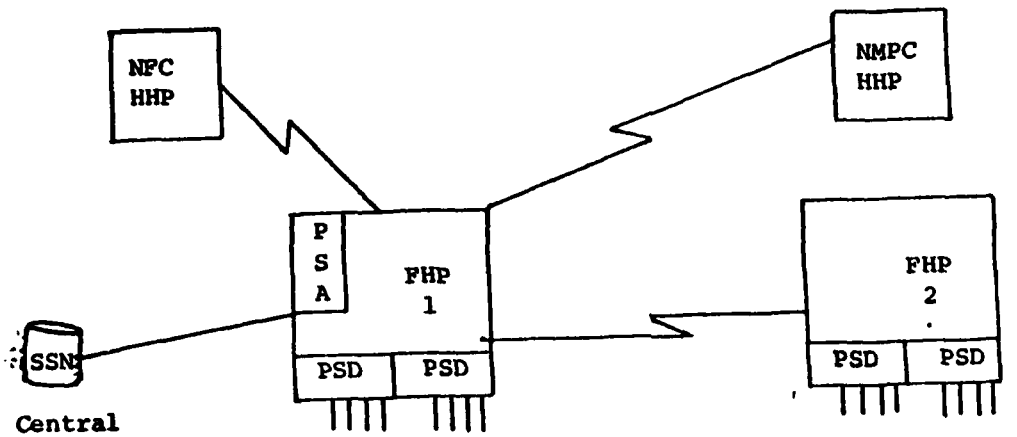


Fig. 2. Level One. HHP-NARDAC Network Structure. Level One consists of multiple NARDACs. Each NARDAC is a processing center (PC). Each PC may contain multiple (1-3) PSAs. Each PSA may consist of 1-4 FHPs.

LEVEL TWO--PSA NETWORK DESIGN



FHP PROCESSING REQUIREMENTS:

FHP 1

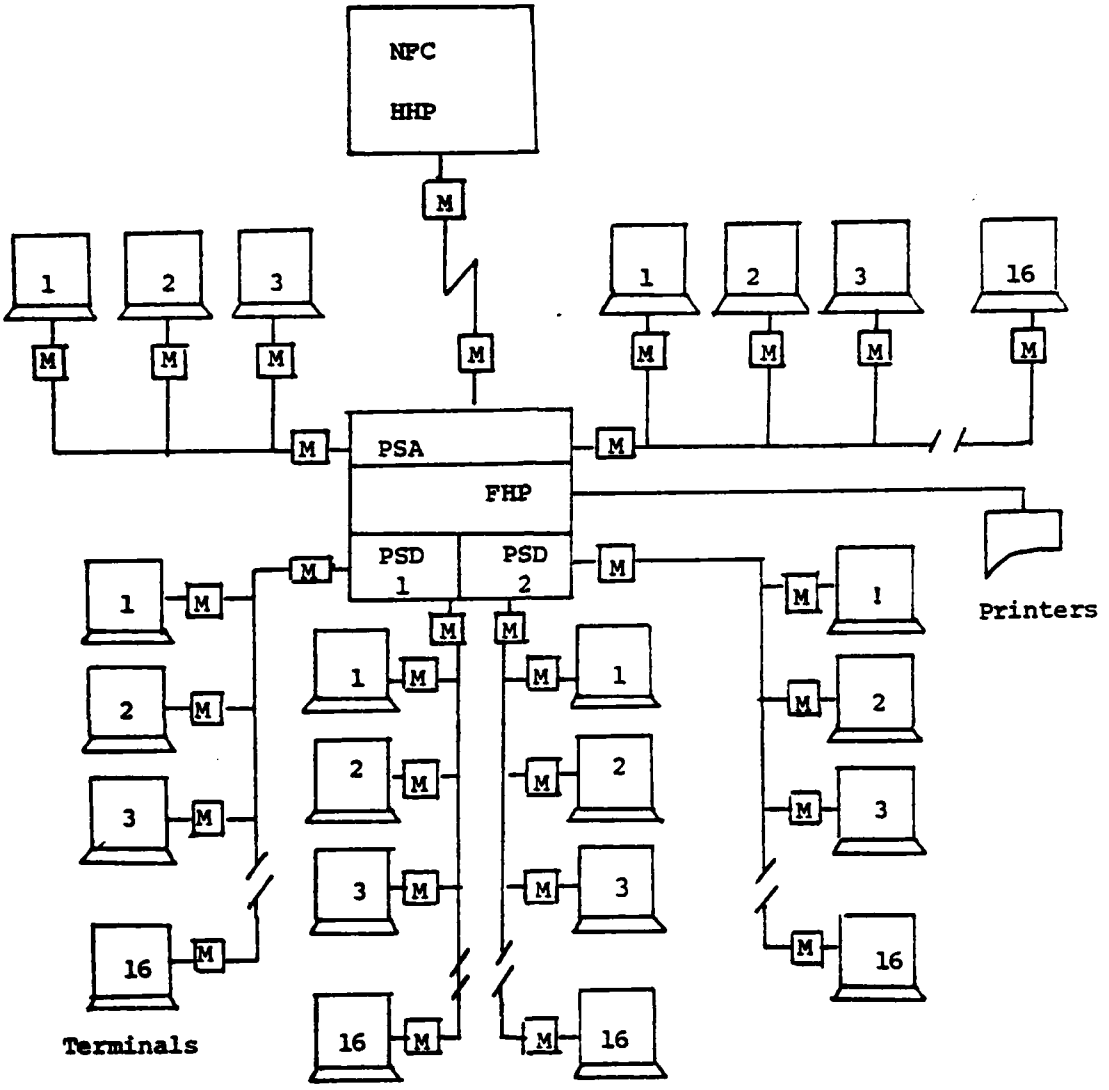
- Maintain Central PSA SSN Database
- Process PSA Management functions
- Process PSD functions
- Communicate with 1-3 other FHPs

FHP 2

- Communicate with FHP 1
- Process PSD functions

Fig. 3. Level Two. PSA Network Structure for a PSA containing two processors. In this environment, only one FHP will communicate directly with the HHPs. Others will relay information to that FHP for transmission.

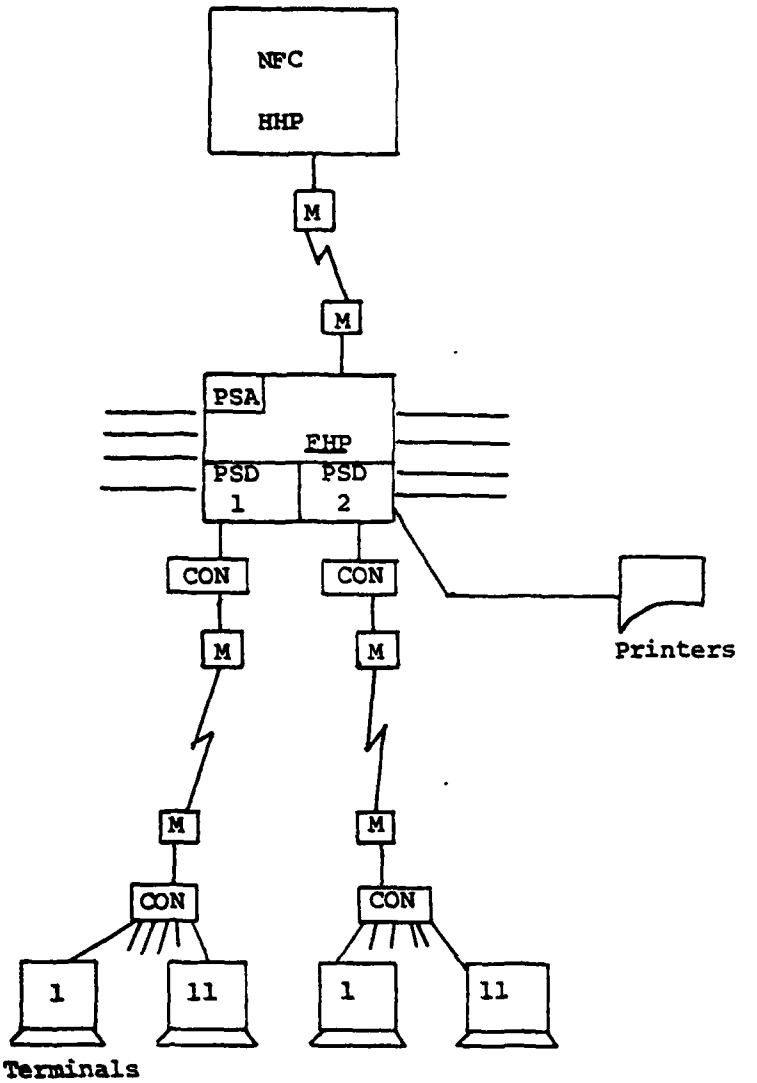
LEVEL THREE--PSD STRUCTURE (SYNCHRONOUS TERMINALS)



M = Modem

Fig. 4. Level Three. Design for PSD level SDS support using synchronous terminals. No concentrators required.

LEVEL THREE--PSD STRUCTURE (ASYNCHRONOUS TERMINALS)



CON = Concentrator
M = Modem

Fig. 5. Level Three. Design for PSD level SDS support using asynchronous terminals. Design requires addition of signal concentrators.

reserved for local command use to enable inclusion of data elements required for local command information requirements but not required in support of the master personnel and pay data bases of SDS.

SDS will provide on-line query access to members' records contained in the mini-master data base, including local data elements. In addition, the system will provide on-line single record print capability. Standard and Ad Hoc reports will be requested via terminal input; however, such requests will be deferred by the system for printing in the batch environment after normal daily communications periods. Examples of standard reports are:

1. Activity Locator;

2. Report of Active Duty Obligations and Projected Rotation Date; and

3. Enlisted Personnel Advancement Eligibility.

Ad Hoc reports are reports which may be initiated from the local data base via CRT terminals. Such reports are designed by the user at the point of entry. Examples of questions which may be answered via ad hoc reports are:

1. How many LCDRs are assigned?

2. How many personnel are due to depart the command in the month of October?

3. List prospective PCS gains and Losses for a particular command.

4. List Separations/Retirements due in the next six months.

5. List members of the command who will be transferring to Fleet Reserve this month. [Ref. 12]

While final definition of which reports will be standard and which ad hoc has not yet been officially promulgated by the SDS project office, a list of user-identified candidates for reports to be produced from the local data base is contained in Appendix B. [Ref. 13]

III. FIELD LEVEL SITE PREPARATION RESPONSIBILITIES AND GENERAL CONSIDERATIONS

Site preparation is the term utilized to describe those activities required to ensure proper physical facilities are available to install and support a delivered computer system. Although the system components being installed at field level offices do not include the highly technical components of a computer system which would require extremely controlled operating environments, effective field level site preparation to support terminal equipment is an essential prerequisite to achieving smooth and timely installation and transition to the new system of support.

Site preparation activities of primary concern to field level managers normally involve four major areas of support capability: (1) electrical power support; (2) telecommunications support; (3) deliverability of systems components support; and (4) air-conditioning/special equipment support. Since the field offices will be equipped only with CRT terminals, companion printers, and one medium-to-high speed printer, the air-conditioning and special equipment support area is only of minor coneern, and would be considered when special air-conditioning or equipment support requirements are required for the high speed printer equipment. General responsibilites and considerations pertaining to each of the other three major support areas are discussed below.

A. ELECTRICAL POWER SUPPORT

Primary field level responsiblity in this support area will be to identify extisting electrical support available in the current facility, and to identify and initiate any required modifications to the existing power system which will be required to support the various SDS terminals and printers. Field level managers will be responsible for determining whether wiring will be adequate to provide proper voltage and amperage for each unit, and for determining the number, type, and location of terminals and printers.

In determining adequacy of wiring, while specific power load requirements will be dependent on the type and number of terminals and printers selected and delivered to each site, basic electrical power support required in support of each terminal normally consists of 110V AC 15-20 AMP, 3-way plug dedicated circuits to ensure uninterrupted service. High-speed printers will normally require 220V electrical support. Where possible, the use of normal convenience plugs should be avoided as such outlets are often disrupted due to overloading.

The electrical system to support the field level temrinal/printer network should be designed to provide continuity of power to the system. Since the terminals are designed to be used interchangeably, a modular system of electrical support, i.e., different circuits supporting

supporting different clusters of equipment, should be considered to preclude total loss of the system in the event of power loss to various circuits. In addition, the telecommunications system will assign 10-11 terminals to each signal concentrator, and each of these subsystems will require a separate electrical support circuits. In determining the number, type, and placement of electrical outlets to support SDS terminals, where possible, outlets should be located as close as possible to each component in order to minimize cable length and to avoid the overuse of extension cords.

B. TELECOMMUNICATIONS SUPPORT

While overall responsiblity for determining SDS telecommunications requirements rests with the project management office, field managers will be required to assist in providing information essential to establishing inadequate sizing of telecommunication support for their respective activities during the implementation phase, as well as for initiating local action to attain such support capability at the field level activity prior to delivery of the system components. Establishment of adequate sizing will entail the acquisition of information regarding existing telecommunications support availability as well as analysis and reporting of telecommunications support modifications which will be required by the porposed terminal configuration. Such analysis, which will

entail analysis of anticipated data flow incurred under SDS, is essential in ensuring adequate telecommunications lines are established to link the PSD with its supporting NARDAC, as well as in ensuring adequate lines are establised to extend internal network of terminals and printers to desired locations within the local facility. As mentioned previously, current plans entail a system with one signal concentrator for each 10-11 terminals. All terminals must be located within 1000 feet of the related concentrator. Beyond this distance, an additional piece of telecommunications equipment, a signal translation device called a modem, must be added to support the telecommunications system. Because of this fact, it is highly recommended, and may be required by the project office, that all terminals be located within the prescribed 1000 foot distance. Specfic technical and size requirements of the network connections have not yet been fixed at the project level, as they are dependent on the number of devices and the volume of data that will flow between the remote devices and the various field host processors. However, a primary consideration for the field manager is the fact that an increase in the number of terminals, variation from single site installation, or inclusion of expansion capability will cause an increase in the number of circuits and modems. Therefore, accurate identification of configuration and terminal requirements is essential to ensure proper telecommunications support is available.

C. DELIVERABILITY SUPPORT

While of seemingly less criticality than the two previously mentioned support areas, the provision of deliverability support is an important responsiblity for field managers. This support consists of ensuring that a facility will be prepared to receive the components when delivered for installation. Activities within this support area include identifying any potential problems with physical capacity which might preclude delivery and installation of equipment without damage, monitoring delivery schedule and ensuring delivery capability is provided, and ensuring the installation sites are clean, clear of obstruction and ready to receive delivered equipment.

IV. EQUIPMENT ALLOCATION AND TERMINAL CONFIGURATION DESIGN CONSTRAINTS

A recurring determinant in each of the site preparation support capabilities is the proposed terminal configuration desired at the field level activity. All site preparation activities are contingent upon the design of the network of terminals which will be implemented. Thus, a most critical area of concern for the field manager will be the determination of where terminals and printers should be located within the facility and the organization. The objective of SDS at the field level is to provide an efficient and effective system of data entry which will replace current manual input procedures. This objective should be the major consideration when designing the terminal network and determining the number of terminals required and allocation within the organization.

Effective equipment allocation and terminal configuration planning requires a careful and detailed analysis of the support to be provided by SDS and the interaction of personnel required in processing different types of transactions under the new system. In addition, while all terminals will be delivered during implementation of SDS Release 1, certain functions will not be included until future releases. Such functions must also be considered in any analysis to ensure

the desired or proposed configuration will be able to accommodate support requirements which will be added by Releases 2 and 3.

In designing a terminal network for SDS, several constraints must be considered. The number of terminals being proposed for each field level office was estimated on the basis of one CRT terminal in support of each four assigned personnel. Thus, the ceiling constraint in the first analysis of an alternative configuration is the number of terminals currently proposed for delivery to the particular activity. Within this planning constraint, the field manager will have the authority and responsiblity of determining whether the estimated number of terminals is sufficient as well as where the terminals should be located within the facility and organization.

When determining optimal location of terminals within the organization, primary consideration should be given to the workflow and input volume to be supported by each terminal, the terminal access time required by various types of data input, the frequency of data input which must be supported, the number of personnel requiring parallel access capability within a support area, and the proximity of terminal operators and supervisory and/or authorizing personnel.

Other constraints which must be considered when determining equipment allocation and terminal configuration

include: (1) space requirements; (2) environmental considerations, and (3) security considerations. These constraints are briefly described below.

A. SPACE REQUIREMENTS

PASS field offices will be supported by three types of terminal devices: CRT terminals, companion printers, and a high speed printer. While specific sizes of equipment will not be established until system hardware selection, in general, the size of such equipment does not vary to any large degree. Normally, CRT terminals are desk-top size, and may be positioned either on existing desks or may include a dedicated stand.

SDS is designed to provide one companion printer for each three terminals it supports. Thus, each companion printer should be located in proximity the terminals it will support, which further constrains design and allocation flexibility. The low-speed printers will normally require an additional 6-10 square feet of floor space. In addition, the location of the printers should provide access for storage and loading of feeder paper.

In addition to the required number of companion printers, each PSD will be equipped with a high speed (approximately 600 lines per minute) printer. Such devices normally vary in floor space requirements from 16 to 24 square feet. They may also incur floor weight loading requirements, which may further constrain the possible location within the activity.

B. ENVIRONMENTAL/OPERATIONAL CONSIDERATIONS

Equipment allocation and configuration may also be influenced by the amount of noise produced by the various printers, and possible impacts of such noise levels on the organizational operating environment. The amount and capability of soundproofing equipment included with the printers may also influence possible allocation and location, especially that of the high speed printer. In addition, traffic flow within the working area must be considered to ensure safety, and to minimize unnecessary transit to use the terminals. The type of devices being installed in field level offices are normally capable of operating in a general office environment, with no special considerations required for air-conditioning support capability.

C. SECURITY CONSIDERATIONS

This constraint refers to the amount of security of access required for various terminals and/or printers. It is of primary concern when determining the location of the high speed printer which will be operated after normal working hours and will include check printing during Release 2 for a number of facilities. Security must also be considered when determining the orientation and location of various terminals and printers when data displayed should not be viewed by serviced customers due to Privacy Act requirements. Specific security measures might include controlling access

to the workspace where terminals or printers are located, arranging termianls and/or printers within the workspace so that displayed data can not be viewed by customers being serviced, and establishing policy and procedures to ensure data displays are cleared whenever terminals are left unattended by operating personnel.

V. PROCEDURES FOR DETERMINING EQUIPMENT ALLOCATION AND TERMINAL CONFIGURATION

At the time research for this thesis was conducted, the project level estimates regarding the number of terminals which would be required by various activities were being based on the number of personnel assigned to the activity (one terminal for each four assigned personnel). This approach uses the number of personnel assigned as a surrogate measure of the activities' processing volume and requirements. A transaction-volume based estimation would provide a more accurate approximation to terminal requirements since the SDS system will entail a fundamental change to an activity's operating environment and calculations of SDS environment terminal requirements based on the existing operating environment may be misleading, if not completely erroneous. Both the volume and processing time required in support of functions may vary (for example, the number of receipts and transfers processed at a training command would tend to be higher than at a normal duty station; and overseas transfers would normally require more processing than a domestic transfer due to overseas screening procedures, etc.), or, in some cases, be unique to a particular field activity (for example, a remote site customer service requirement). However, most SDS functions

to be supported will be common to all shore based field activities. Given this commonality of the majority of SDS functions, it is conceivable that a centralized transaction-volume based approach to determining the number of terminals required to support various volumes of SDS transactions could be developed at the SDS Project Office level. This calculation could be based on analysis of the expected terminal processing time required to complete various SDS entries which could be conducted as the program design for SDS is being developed. Using such estimates, the number of terminals required for various volume levels could be calculated, tabularized, and promulgated to field activities to enable field managers to select the number of terminals required to support local activity transaction volume levels. If possible, the project office analysis of terminal requirements should be computer-based and should generate forms which (1) show project office estimates of transaction workload and associated terminal requirements and (2) provide boilerplate forms for the local field activities to complete which would highlight any differences between local estimates and those provided by the project office. In addition, if this approach were adopted, a type of hotline could be established within the project office which could be utilized whenever field activities are unsure of procedures to be utilized in applying the transaction workload analysis to a particular type of transaction. Pending such guidance, it is recommended that a field activity transaction-volume

based analysis of terminal requirements be undertaken to verify the accuracy of the SDS Project Office estimation of support requirements. This chapter presents an approach to conducting such an analysis as well as procedures for determining terminal allocation within the physcial facility once the number of terminals required has been calculated.

Due to the complexity and interaction of design constraints identified in the preceding section, a systematic approach to determining equipment allocation and terminal configuration is essential in ensuring all factors are considered which may impact site preparation requirement and activities. The procedures described below reflect a management science approach to the determination of equipment allocation and terminal configuration as a problem-solving or decision-making process. This approach states that any decision making process involves four major steps:

1. Defining the problem;
2. Searching for alternative courses of action;
3. Evaluating the alternatives; and
4. Selecting an alternative. [Ref. 14]

Since the determination of equipment and terminal configuration is in effect a decision-making or problem-solving process, the management science approach to analysis identifies where the decision maker is operating in the overall process when performing various tasks.

A. DEFINING THE PROBLEM

The essential problem involved in SDS equipment allocation and terminal configuration is to provide required SDS functional support with the number of terminals and physical allocation and location acting as constraints upon the optimization of this objective. Thus, an understanding of SDS functions and workflow is essential. Prior to any major and possibly irrevocable decisions, it is highly recommended that field managers review and analyze SDS functions which will be supported under the new system in conjunction with currently-used forms and transactions in order to develop an indepth understanding of how SDS will replace and/or modify current reporting procedures and to identify alternative workflow structures which could result from the implementation of SDS.

Detailed description of SDS transactions is included in the SDS Project Requirements Document, which includes descriptions of screen formats which will be provided under SDS. While this document would be the ideal basis for the analysis, analysis of currently used forms which support the different SDS functions could also be used to estimate the volume of SDS transactions which will occur in each section under the new system.

Appendix C illustrates one possible approach which could be used in this workflow analysis. The SDS Workflow Analysis Form identifies the forms and transactions

currently employed in support of a particular SDS transaction type, the section(s) responsible for preparation, review, and approval, the current signature authority. This information is also extrapolated to possible alternative workflows which could result from implementation of SDS transaction-types, also showing responsibility for preparation, review, and approval, and associated proposed signature authority.

For each type of transaction processed by the field activity (i.e. receipt, transfer, advancement in rate, etc.), currently used forms are listed and analyzed to determine how such transactions are processed under the existing system. The next step of the analysis is to identify which of the forms currently used will be replaced under SDS. Finally, the impact of the change is identified through the establishment of alternative workflows which could be implemented in the SDS operating environment. As an example of this analysis approach, Figure 6 illustrates the results of the workflow analysis of an officer receipt transaction type.

In this example, the transaction type, Officer Receipt, is entered in the "Transaction Type" column of the SDS Workflow Analysis Form. Then, forms or events currently used to process this transaction type are listed in the "Current Forms Used" column. In the example, the forms and events identified as being used in such processing include the

SDS WORKFLOW ANALYSIS FORM

TRANSACTION TYPE	CURRENT FORMS USED	REPLACED UNDER SDS	CURRENT RESPONSIBILITY			PROPOSED (SDS) RESPONSIBILITY		
			PREP	REVIEW	AUTH	PREP	REVIEW	AUTH
Officer Rec.	NC 3068	1	R/T	R/T	P.O.	R/T	R/T	P.O.
	Diary	1	P/A	P/A	P.O.	R/T	R/T	P.O.
	Locator	1	P/A	P/A	P.O.	R/T	R/T	P.O.
	Pay Rec	-	DISB	DISB	D.O.	DISB	DISB	D.O.
	NP 1070 602	1	C/S	C/S	P.O.	R/T	R/T	P.O.
	Tvl Clm	2	Tvl	Tvl	D.O.	Tvl	Tvl	D.O.
	LES	2	DISB	DISB	D.O.	DISB	DISB	D.O.

R/T Receipts/Transfers
P/A Personnel Accounting
C/S Customer Services
DISB Disbursing
Tvl Travel
P.O. Personnel Officer
D.O. Disbursing Officer

Fig. 6. Sample SDS Workflow Analysis Form.

Reporting Endorsement to Orders (NC 3068), the diary entry, addition of the individual to the local activity locator, establishment of a current pay folder and associated changes to the Leave and Earnings Statement, update of the Record of Emergency Data (MP 1070/602), and the processing of a Travel Claim. This list is not all-inclusive, but is provided for illustrative purposes. Using Appendix B, the List of Forms/Events to be Replaced under the SDS, the SDS release under which each form is to be replaced is identified and listed in the column, "Replaced Under SDS". The next column of the form, "Current Responsibility", identifies the current section(s) within the organization which have responsibility for the preparation, review and authorization of each form being analyzed (i.e. R/T = Receipts and Transfers section currently processes the Reporting Endorsement to Orders, C/S = Customer Services section porcesses the update of the Record of Emergency Data, etc.) The final column, "Proposed Responsibility", identifies the section(s) which could feasibly process each form under the SDS operating environment. In the example, the Receipts and Transfers Section would assume responsibility for Diary entries, update of the Record of Emergency Data, and addition of the name to the local activity locator, while Disbursing would retain responsibility for the pay-related processing, and the Travel Section would retain responsibility for processing the individual's travel claim.

In utilizing this approach to function and workload analysis, field managers should attempt to discern possibilities for combining the responsibilities for a particular transaction type into one section under SDS. In addition, this analysis will also aid in determining possible organizational changes that could be incurred by SDS. For example, if two sections frequently interact in the preparation of numerous types of SDS transactions, they could be considered for combination or colocation under the SDS system to improve communications and reduce the overall number of terminals required to process particular transaction types.

B. SEARCHING FOR ALTERNATIVE COURSES OF ACTION

In order to determine possible alternative courses of action, the minimum requirements imposed by each type of constraint must be identified and analyzed.

To identify the constraint imposed by the number of terminals, an analysis of transaction workload is required to determine the minimum number of terminals required to provide each section with SDS support capability. The forms developed during the problem definition workflow analysis could be used as the basis of further investigation and detailed identification of the volume of data which must be processed by each section within the activity, and the associated number of terminals required to support such processing. For each SDS transaction type, currently-used

forms and transactions should be analyzed in depth to determine the number of terminals required to support SDS processing which will replace each form currently used by the section. By estimating the volume and access time required in processing various transactions, total terminal processing support which will be required by each section can be approximated. In addition to transaction support, the field manager should analyze the amount of query support capability required by various sections which could also impact the number of terminals required by identifying query as one of the transaction types in the analysis.

In analyzing terminal support requirements, the variation in volume or terminal access required which is caused by particular events (e.g. exam results, W2 receipts, etc.) or particular times of the day, week or month, (e.g. Monday morning receipts, inquiries prior to or immediately following paydays, influx of report requests which may occur at particular times of the month, etc.) should be identified to analyze how well a proposed number of terminals could support the increased volume and access requirements.

Other constraints imposed upon the number of terminals required should also be included in the analysis, such as the necessity to maintain a non-fully utilized terminal in a specific location in order to provide an essential service (e.g. remote customer inquiry locations, travel claim clerks, etc.). Such constraints imposed by existing

organizational commitments or physical location should be kept to a minimum, where at all possible, in order to maintain maximum flexibility in determining possible alternative configurations.

Appendices D through I illustrate a possible approach to such an analysis. Appendix D is an example of a transaction/workload analysis form which identifies the frequency and volume of transaction, the estimated number of entries involved in processing the transactions, the preparation time required to prepare data for final entry, and the estimated processing time required to complete finalized data. This analysis would be completed for each form and event processed by each section. This analysis is useful in identifying the variations in processing time required for the various forms, that is, the timing, number of entries, and associated machine processing times may be different for various forms utilized in the same transaction type. As an example, the result of the Transaction Workload Analysis of the Reporting Endorsement to Orders (NC 3068) form used in the Officer Receipt transaction is illustrated in Figure 7.

Since the Receipt transaction type normally can be expected to be processed on a daily basis, the columns of the form with "Daily" headings are utilized. (With the exception of the variance columns, which are utilized to describe peak load occurances within the organization.)

TRANSACTION WORKLOAD ANALYSIS FORM

	DAILY VOLUME			WEEKLY VOLUME			MONTHLY VOLUME			ENTRY VOLUME			MANUAL PROCESSING TIME			MACHINE PROCESSING TIME			DAILY VOLUME VARIANCE		WEEKLY VOLUME VARIANCE						MONTHLY VOLUME VARIANCE				
NAME	L	N	H	L	N	H	L	N	H	MIN	NORM	MAX	MIN	NORM	MAX	MIN	NORM	MAX	AM	PM	M	T	W	TH	F	Pay day	1	2	3	4	Pay
Curtis	5	10	15							2	6	10	2	5	7	3	7	10	H	N	PL										
Brighter	3	7	12							2	5	10	3	6	8	2	6	8	H	L	PL										
Stewart	-	5	8							2	7	10	5	7	9	4	8	12	L	H	PL										
TOTAL	8	22	35							6	18	30	10	18	24	9	21	30													
AVG	4	7	12							2	6	10	3	6	8	3	7	10													

SDS Transaction Type *Officer Receipt*

Form NC3068

Section Receipts/Transfers

Fig. 7. Sample Transaction Workload Analysis Form.

For other types of transactions, such as Reserve Drill Information or Promotion processing, columns with headings "Weekly" or "Monthly" would be utilized depending on the normal frequency of such transaction processing. In the example, for each individual assigned to the section, the range in volume of Reporting Endorsements to Orders which are currently being processed during a normal work period is estimated and listed under the "Daily Volume" heading. Next the estimated range in the number of entries required to process the form is included in the "Entry Volume" column of the form. The "Manual Processing Time" column identified the range in time required for each individual to manually prepare the form for processing, that is, the time required to obtain required information, gather data, physically locate the required forms, etc. (This information, while not directly involved in the determination of terminal requirements, provides information regarding the possible assignment of particular individuals to a shared terminal, based on the operating environment of the section.) The "Machine Processing Time" column contains the estimated range, for each individual, of the time required to actually type the minimum, normal, and maximum number of entries in processing a single transaction (based on the contents of the "Entry Volume" column). (If the centralized approach recommended at the beginning of the cahpter were adopted, the transaction workload analysis

"Machine Processing Time" would be a standard time provided by the project office.) The "Daily Volume Variance" column contains information regarding the variance in volume of transactions processed by each individual during a normal working period. In the example, Curtis and Brighter normally process a high volume of this type of form during the morning hours, while Stewart normally processes a higher volume in the afternoons. (This variance would normally be caused by the duty assignments of individuals within the section. This is, Curtis and Brighter have primary responsibility for Receipt processing in the mornings, while Stewart takes over in the afternoons.) Additionally, as indicated by the "Weekly Volume Variance" column, a peak load of this type of form is normally experienced on Mondays. This information is included so that field managers may compare the occurrances of peak loads within the organization in order to ascertain whether terminals would be available from other sections to assist in supporting a particular section's peak load processing requirements. The final step in performing the Transaction Workload Analysis for a particular form is to total the volume and processing time columns and calculate averages for each column. Such averages would smooth out the individual variations and give an estimated volume and processing time required by the section as a whole.

The next step in determining the number of terminals required to support a particular section is to calculate the

estimated terminals required to support each form and obtain total requirements for the section. Using the information obtained from Appendix D, field managers should compute the estimated number of terminals required to support processing of each form. Appendices E and F illustrate two possible methods by which such an estimation might be calculated. Appendix E develops a Terminal Access Requirements Matrix which estimates the terminal access requirement range for each individual at each level of transaction volume/machine processing time combination. An example of the results of such an analysis is illustrated in Figure 8. Entries are calculated by multiplying each individual's "Daily Volume" column entries by the respective "Machine Processing Time" column entries of Appendix D to give a terminal access requirement range. For example, the range of processing time required for Curtis to process a low volume of transactions is indicated by the L-MIN, L-NORM, and L-MAX entries associated with his line of the matrix. This range indicates the processing time required if transaction volume is low and the number of entries required varies from the minimum for each transaction to the maximum for each transaction. Similarly, Curtis' ranges of processing time required for a normal and high volume of transactions are indicated by the other entries of his matrix line. Once individual ranges are calculated and entered on the form, entries in each column are summed to give the section total ranges for the particular form being

SECTION TERMINAL ACCESS REQUIREMENTS (METHOD 1)

SECTION Receipts/Transfers SDS TRANSACTION TYPE Officer Receipt

FORM NC 3068

NAME	L-MIN	L-NORM	L-MAX	N-MIN	N-NORM	N-MAX	H-MIN	H-NORM	H-MAX
Curtis	15	30	50	30	70	100	45	105	150
Brighter	6	18	24	14	42	56	24	72	96
Stewart	--	--	--	20	40	60	32	64	72
TOTAL	21	48	74	74	152	216	101	241	318
TERMINALS:									
8-HOUR WORKDAY	.04	.10	.15	.15	.32	.45	.21	.50	.66
10-HOUR WORKDAY	.04	.08	.12	.12	.25	.36	.17	.40	.53
12-HOUR WORKDAY	.03	.06	.10	.10	.21	.30	.14	.33	.44

ESTIMATED NUMBER OF TERMINALS REQUIRED .40

Fig. 8. Sample Section Terminal Access Requirements (Method 1).

analyzed. Then, the number of terminals required to support processing of the from is calculated for differing workday lengths by dividing the total access time required at each volume/processing time combination by the access time available per terminal in a given workday length. (For example, in an 8-hour workday, a terminal would be available for access for 480 minutes). Once the expected ranges of terminals required have been calculated, the field manager must select the number of terminals which, based on experience and knowledge of operating volume levels, would most likely be required to support this form in the SDS environment. While this is a subjective decision, the previous analysis will provide some information upon which to base the decision so that it is not a totally abstract estimation. Appendix F illustrates another method of approximating terminal requirements. This method utilizes section total volume requirements at various volume levels, but uses average processing time in developing total access requirements for the section. This appendix is not illustrated in the body of the thesis. The total access requirement for each volume level is then divided by the available access time per terminal as in Appendix E. Due to the similarity of this analysis, Appendix F is not illustrated.

While either method could be used to estimate the number of terminals required to support processing of a particular form, the first method more clearly identifies which

individuals within the section might require more access time than others, a factor which might impact the decision of where the terminals would be located within the section in the SDS operating evironment, as well as which individuals should be assigned to a given terminal to optimize terminal usage.

Appendix G illustrates an additional analysis required to adjust the estimated number of terminals to accommodate peak loading volumes and/or other operational or physical constraints. Peak load analysis involves the calculation of the peak load access requirement for a given form. This adjustment is calculated by multiplying the expected peak load volume of the form by the various machine processing time requirements identified in Appendix D, and then dividing the results by the peak load duration to obtain the range of number of terminals required to support the peak load period. For this calculation, average Machine Processing Times are utilized. For example, in the Officer Receipt example, a peak load might be expected to occur on Monday mornings, from 0800 to 1200. If the estimated volume level is assumed to reach 35 transactions during the peak load period, the range of terminal access required to support this volume level is calculated for each entry volume level as follows:

Peak Load Volume X Minimum Machine Processing Time =

35 X 3 = 105

Peak Load Volume X Normal Machine Processing Time =

35 X 7 = 245

Peak Load Volume X Maximum Machine Processing Time =

35 X 10 = 350

These volume/machine processing time combinations are then divided by the expected peak load duration (in this case, since the peak load lasts four hours, the peak load duration = 60 X 4 = 240) to obtain the expected number of terminal support required for peak load processing. In the example above, the range of terminal support is calculated to be:

Volume/Processing Combination	Terminals Required
PL-MIN	.44
PL-NORM	1.02
PL-MAX	1.46

As in Appendix E or F, once the range of terminals requied has been calculated, the field manager must select the most likely number of terminals which will be required to support the peak load processing volume. Peak load adjustment analysis should be conducted for each form. In addition, once all forms have been analyzed, the requirement for additional termianls to support particular forms or events should also be identified and noted during the Terminal Requirements Adjustment Analysis. For example, if a certain number of travel claims were expected to be processed at a remote site, the estimate of the number of

SECTION TERMINAL/PRINTER REQUIREMENTS SUMMARY

TRANSACTION TYPE	FORM	ESTIMATED TERMINAL REQUIREMENTS	PEAK ADJUST	OTHER ADJUST	TOTAL TERMINAL REQUIREMENTS
Ofcr. Rec.	NC 3068	.4	.4	---	.8
	Diary	.3	.2	---	.5
	NP 1070 602	.2	---	---	.2
	Locator	.2	---	---	.2
Ofcr. Trf.	NC 3067	.4	.4	---	.8
	Locator	.2	---	---	.2
TOTAL		2.0	1.2	---	3.2
TOTAL PRINTER REQUIREMENTS 1.07					

SECTION Receipts/Transfers

Fig. 9. Sample Section Terminal/Printer Requirements Summary.

FACILITY TERMINAL/PRINTER REQUIREMENTS SUMMARY

SECTION	ESTIMATED TERMINAL REQUIREMENTS	PEAK ADJUST	OTHER ADJUST	TOTAL TERMINAL REQUIREMENTS	TOTAL PRINTER REQUIREMENTS
R/T	2.0	1.2	---	3.2	1.07
C/S	1.2	---	1.0	2.2	.73 (1.73)*
ESO	.6	.8	---	1.4	.47
P/A	1.4	.3	---	1.7	.57
R/S	1.5	.2	---	1.7	.57
Admin	.1	---	---	.1	----
Disb (2)	2.0	1.8	---	3.8	1.27
Tvl (2)	2.0	---	1.0	3.0	1.00 (2.00)*
TOTAL RELEASE 1	6.8-->7	2.5-->3	1.0-->1	10.3-->11	3.41-->4 (6)*
TOTAL RELEASE 2	11.8-->12	4.3-->5	2.0-->2	17.1-->18	5.68-->6 (8)*

* Additional printers required for remote site print capability, if desired.
(2) Support capability not required until Release 2.

R/T	Receipts/Transfers	R/S	Reenlistment/Separations
C/S	Customer Services	Admin	Administrative/Legal
ESO	Educational Services	Disb	Disbursing
P/A	Personnel Accounting	Tvl	Travel

Fig. 10. Sample Facility Terminal/Printer Requirements Summary.

terminals required to support Travel claims should be adjusted to reflect this requirement.

Once the above analysis has been completed for each form or event processed by a particular section, the section total terminal requirements are summarized according to procedures outlined in Appendix H and illustrated in Figure 9. This form summarizes the information contained in Appendices E-G for each form processed by the section. Once the matrix has been completed, the "Total Terminal Requirements" column is summed and divided by three to obtain the estimated number of printers required to support the section terminals. Once completed, these forms depict the approximate number of terminals and printers required by each section.

Following the detailed analysis for each section, the terminal and printer requirements are summarized for the entrie organization utilizing the Facility Terminal/Printer Requirements Summary (Appendix I), illustrated in Figure 10. This form shows the terminal requirements of each section, as well as the estimated printer requirements for each section (contained in Appendix H for each section). It should be noted that this form includes terminal/printer requirements for all SDS Releases, even though some terminals and printers (i.e. Disbursing and Travel) may not be required until Release 2. The form, however, shows all requirements in order that modifications to support capability required to support the final number of terminals may be undertaken

during the initial site preparation process, to preclude the necessity of remodification at a future data. The Facility Terminal/Printer Requirements Summary provides an overall summary of total terminal/printer requirements and proposed allocation within the organization.

Comparison of section summary information may indicate alternative configurations or organizational structures which would enhance utilization of terminals. For example, if the analysis indicates one section requires 2 1/2, terminals while another would require 3 1/2, consideration could be made to augmenting one section's total number of terminals and providing or scheduling access time by the other section, or perhaps for colocating the two sections in proximity and combining the total number of terminals for the two sections. When considering such possible alternatives, however, it is important to bear in mind the variation in terminal access timing caused by operational environment to ensure peak workloads would continue to be supported by the new configuration.

While the transaction/workload analysis will undoubtedly require a certain amount of time and effort, it may prove to be of inestimable value in determining the impact of receiving various levels of terminals on the operational capability of the organization. It must be emphasized that all calculations are based on estimated requirements and as such are only approximations to the actual terminal requirements

of the organization. However, having analyzed and evaluated the estimated number of terminals required, field managers will be able to compare locally-prepared estimates with the number of terminals estimated by the project office. Any deviations in terminal support requirements should be reported and reconciled prior to actual site preparation activities. Since limited funding is available from the project office to assist in facility modification or to increase the number of terminals provided, the local analysis could also be used to provide justification for funding requests to either the project office or major claimants, and to identify the reduction or change in mission support capability which could result from decisions regarding terminal levels authorized.

Having determined the number of terminals and printers required, the next step in searching for alternative courses of action entails the identification of possible alternative terminal configurations within the organization and physical facility. In order to analyze alternatives, the field manager should obtain copies of the facility floor plan which, if possible, include an electrical wiring diagram and telecommunications capability diagram. If a consolidated diagram is not available, the field manager should obtain separate copies and compile complete versions by annotating the floor plan with information regarding existing electrical and telecommunications support capabilities.

Utilizing numerous copies of the floor plan, field managers should develop alternative possible equipment configurations which could support the SDS functional organization. Diagrams should be annotated with the modifications to existing electrical and telecommunications capabilities which would be required to support the associated configuration. It is recommended that as many feasible alternative configurations as possible be developed. While one alternative would depict the SDS functions superimposed upon the existing organizational design, the analysis should not be restricted to this one particular design. Other alternatives which have been identified furing the workflow analysis should also be considered in order to assist in a cost/benefit analysis of proposed configurations. Various configurations should depict terminal, printer, and office equipment locations as they would be required to suport an SDS functional organization. It is emphasized that configuration design should consider the requirements which will be imposed under all SDS Releases, and not merely those resulting from Release 1. In addition, where possible, modifications should include those which would be required to expand the number of terminals which could be supported in order to preclude costly modifications in the future. Diagrams should depict the desired location and electrical requirements for terminals, printers, and typewriter support, non-telecommunications telephone capability

requirements, and telecommunication circuit information regarding proposed clustering of terminals and printers. (That is, which 10-11 terminals would be serviced by each concentrator.)

Figure 11 depicts a sample floor plan showing the layout of a hypothetical proposed Receipts and Transfers section. In this example, previous analysis has indicated that 2 CRT terminals and 1 companion printer (which will also be used by the adjacent Customer Services Section) will be required to support SDS. However, the drawing includes the notation of where an additional CRT terminal could be located to provide expansion capability.

While this example uses different types of lines to differentiate between existing and proposed support capabilities, the use of a color coding scheme to differentiate between existing and required or desired electrical and telecommunications support capability could also be utilized. Whatever method is selected, the extent of modification required must be identified for each proposed configuration.

C. EVALUATING THE ALTERNATIVES

In analyzing possible terminal/equipment configurations, the use of a checklist approach to the analysis would assist in ensuring all alternatives are being compared according to the same criteria. Appendix J contains a sample of the contents of a possible checklist which could be used in developing feasible alternative equipment configurations. This sample checklist

RECEIPTS/TRANSFERS SDS CONFIGURATION FLOOR PLAN

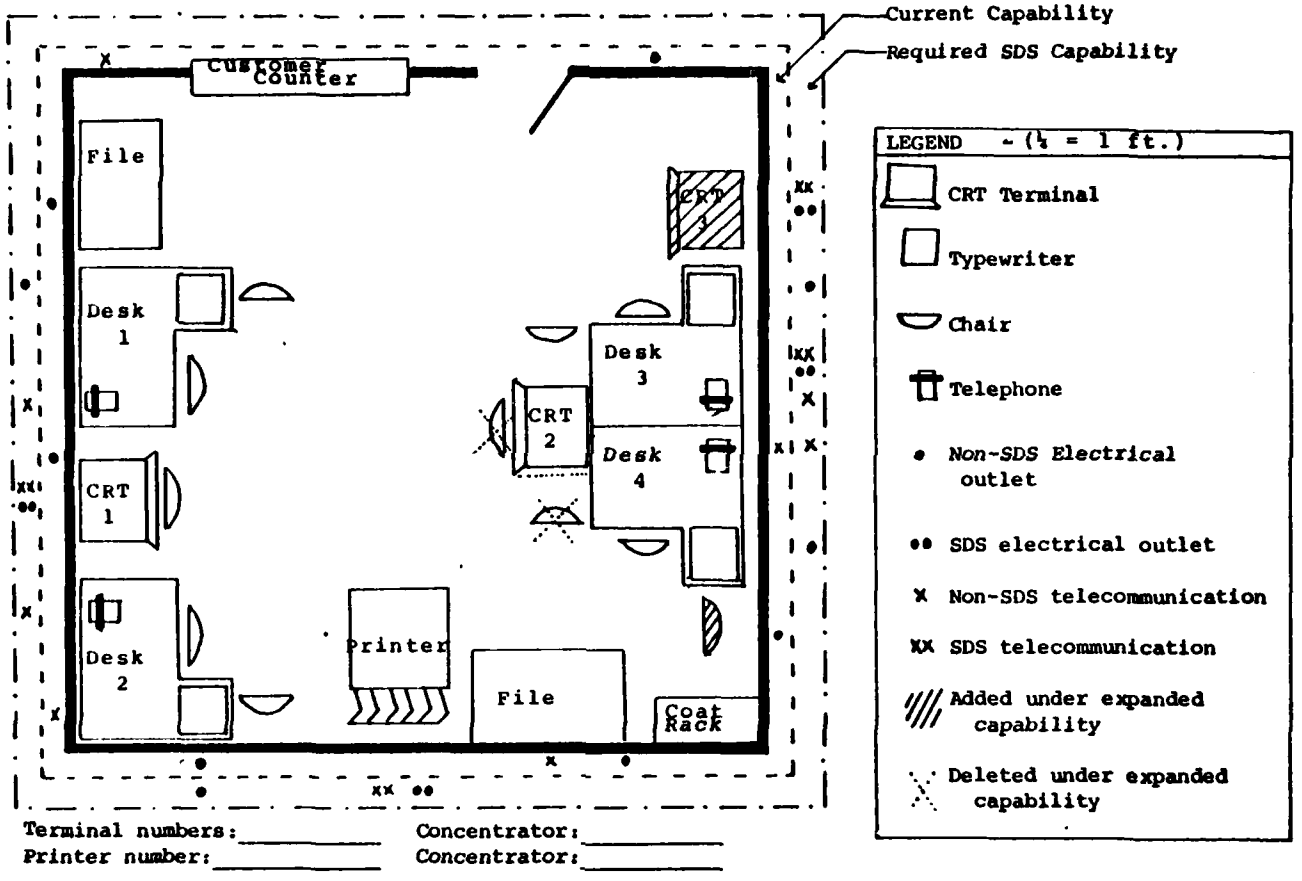


Fig. 11. Sample SDS Configuration Floor Plan.

identifies the variable factors which must be measured and analyzed when attempting to design an alternative configuration, including considerations imposed by the constraint factors identified in the beginning of the chapter.

The analysis of configurations performed utilizing the approach described in Appendix J will result in the identification of the alternative feasible configurations which would support SDS functional organization. An additional checklist, contained in Appendix K, can also be used to evaluate the proposed configurations and ensure the modifications to existing electrical support capability and telecommunications support design associated with a proposed alternative have been identified and considered. As the final step in evaluating alternatives, prior to selecting a design configuration, requests for cost estimates to attain the various feasible configurations should be submitted to the local area Public Works Department and/or telecommunications support activity. Actual selection of an alternative should not be completed until the costs associated with the various alternatives have been evaluated.

In addition to a cost estimate, field managers should request information regarding lead time required to perform the proposed modifications, an estimate of when the requested work could be scheduled if authorized, and the length of time which would be required to actually perform the requested modifications. Once the requested information has been received, field managers will be in a position to evaluate

alternative configurations in light of all constraining factors--cost, timing, and operating environment implications. While the previous development of alternative configurations may have produced a certain configuration considered "ideal", the cost, timing, and/or scheduling may be prohibitive.

D. SELECTING AN ALTERNATIVE

In selecting an alternative, the field manager should analyze the tradeoffs between the cost of modifications, impact on the SDS project implementation schedule, and the operational environment which would be provided by different configurations and prepare a list of feasible alternatives in prioritized order of preference. For example, if two or mroe alternatives provide the same operational capability, the oen incurring less cost or timing impact would be preferrable.

For each alternative, deviations to the number of terminals and/or printers proposed by the Project Office estimate, as well as deviations to the project implementation schedule which could result from a particular alternative should be identified. The prioritized list of alternative configurations could be utilized in preparing cost justifications for submission either to the SDS project office or to the activity's major claimant. Thus, if certain funding thresholds limit modification funding, field managers will be able to select a less costly alternative, and report the possible degradation of the SDS support capability which would result.

The procedures utilized in selecting an SDS configuration may be summarized as follows:

1. Review and analyze SDS transaction types in conjunction with currently-used forms which will be replaced by each SDS transaction type.

2. Determine the number of terminals required to support each transaction type.

3. Identify any constraining factors within the organizational structure or physical facility which will impact the number/location of terminals required for any transaction type.

4. Develop alternative configurations utilizing floor plans annotated with existing electrical and telecommunications capabilities.

5. Identify feasible alternatives.

6. Obtain cost estimates and timing/schedule information for each feasible alternative.

7. Prioritize feasible configurations according to cost/time/schedule criteria.

8. Select and obtain approval/funding for final configuration.

A final step recommended prior to initiating the actual site preparation process is to review the selected configuration and summarize all site preparation requirements to ensure they will not be overlooked during the site preparation process.

One approach to this step would be to utilize the associated analysis forms and annotated floor plans which have been developed for the selected configuration to prepare a site requirements list for each room in the facility. A form such as that illustrated in Appendix L could be used to identify which section or personnel will be located in a particular room, the total equipment requirements for the room, the type of modifications required to achieve SDS support capability for that particular room.

Another approach would be to summarize the type of information described above into an overall site preparation requirements list for the entire facility. Still another approach would be to identify requirements by category of modification or support, such as the total electrical requirements, and which rooms are affected, or the total telecommunications requirements by location, etc.

Whatever approach is selected, this final review will assist field managers in ensuring all requirements and site preparation tasks are identified to enable monitoring and evaluation of the actual site preparation process and activities.

VI. SITE PREPARATION ACTIVITIES FOR THE SELECTED CONFIGURATION

Once a configuration has been selected and approved, actual site preparation activities must be planned, initiated, coordinated and monitored in order to achieve the specified support capabilities. Site preparation activities will include:

1. Preparation and submission of work requests to Public Works and/or other support offices for the modifications required by the selected configuration;

2. Coordination and monitoring of modification completion;

3. Monitoring of schedules to ensure requirements are met and coordinated with the overall project schedule; and

4. Scheduling and arranging delivery and installation of SDS equipment within the facility.

Work requests which identify all modifications required by the selected configuration must be submitted to Public Works and/or the telecommunications support activity. In preparing and submitting such requests, field managers should consider lead time requirements and schedule coordination requirements to ensure all work will be completed within the time limits imposed by the overall SDS project implementation schedule.

Once work requests have been accepted by the supporting activities, field managers should obtain information regarding

the scheduling of modifications in order to determine impacts on existing operations which may result. If at all possible, modifications should be scheduled to cause minimal disruption to operational capabilities (i.e. a systematic room by room modification schedule). Since outside activities will be involved, close liaison will be required to ensure all schedules are coordinated and will meet the overall SDS schedule requirements. Additionally, field managers must monitor modification efforts to track potential schedule slippages and to ensure modifications will provide the specified support.

A final site preparation activity not previously discussed in detail will be to establish liaison with the local supply activity and arrange for delivery of SDS equipment and supply support for the SDS equipment operating environment. Field managers will need to identify Supply Department requirements for coordinating delivery of the equipment, and the cost of such support. In addition, steps must be taken to ensure necessary support supplies, such as printer paper and ribbons, will be made available through the local supply system.

Actual site preparation activities for the selected alternative will basically entail the monitoring and control of the efforts to obtain the modifications which have been specified through the previous analysis. Any deviations or slippages in schedule must be identified and reported to the project office.

VII. MANAGEMENT OF THE SITE PREPARATION PROCESS

Effective site preparation requires consideration of the primary management processes of planning, organizing, and control. Consideration of each of these management aspects, as they relate to the SDS site preparation process, is developed below.

A. PLANNING

One author has defined the planning process as "determining in advance the objectives and the means by which objectives may be accomplished." [Ref. 15] Thus, an essential prerequisite to effective site preparation planning is a clear definition of the objective to be achieved, and the associated tasks required to achieve this objective. The objective of the SDS site preparation process is to design and attain efficient and effective SDS functional support at the field activity level.

Tasks required to achieve this objective include:

- analyzing activity support requirements;
- determining the amount of SDS support equipment required;
- determining SDS equipment allocation and configuration within the activity;
- identifying required modifications and costs;
- completing required modifications within cost and schedule constraints;
- monitoring and controlling site preparation activities;

- arranging and coordinating delivery and installation of SDS equipment; and

- acquiring supply support for the operational system.

The second aspect of planning in the site preparation process is to determine the means by which the objective and tasks will be achieved. It should be apparent at this point that the site preparation process is an extensive undertaking which will require a great deal of time, effort, and coordination. Because of the nature and complexity of the process, it is recommended that a project management approach to the site preparation process be utilized. This recommendation is based on the fact that the site preparation process meets the general criteria identified by Cleland and King [Ref. 16] which describe an undertaking where regular functional groups might not manage successfully. Specifically, the site preparation process:

1. is an ad hoc undertaking concerned with a single specific end product;

2. is out of the ordinary, different from a normal routine affair in the organization;

3. is an effort requiring many functionally separated activities to be pulled together;

4. is characterized by strong lateral working relationships requiring continuing coordination and decisions by many individuals, both within the parent organization, and in outside organizations;

5. is essential to successful implementation of the SDS system;

6. involves plans which will be subject to change, requiring organizational flexibility; and

7. requires the concurrent contribution by two or more functional elements and/or independent organizations.

B. ORGANIZING

> "Organizing is the establishment of relations between the activities to be performed, the personnel to perform them, and the physical factors that are needed...a formal structure of task and authority relationships that will foster the effective and efficient attainment of goals. The major concern in organizing is dividing up the jobs to be done, determining the grouping of work, forming authority grades, and equalizing authority and responsibility." [Ref. 17]

Under the project management approach a project team composed of several individuals from within the organization would be established and assigned overall responsibility for all site preparation activities of the organization.

A project team normally consists of a project manager, with overall responsibility for the project and team activities; and various subgroups assigned particular responsibilities for a particular aspect of the site preparation project, such as electrial support analysis, design and coordination, or telecommunications support analysis, design and coordination.

Whatever approach is selected by the field manager, the organization, responsibilities, and authority of the project manager and each project subgroup or team member should be specifically delineated and promulgated within the organization.

Selection of project team members is an important consideration. Effective site preparation will be contingent upon the quality of effort expended by the personnel assigned to the project team. It is therefore recommended that project team members be selected from personnel who hold a responsible position within the existing organization. The project manager should be a senior level middle manager, such as the assistant Officer-in-charge, or a Master or Senior Chief Petty Officer as this individual will act as the representative of the organization and will be required to conduct extensive liaison with outside activities and the SDS Project Office.

As SDS will affect all sections within the organization, the team should include at least one member from each functional area or section who has indepth knowledge of the existing operations and forms which must be analyzed during the site preparation process to ensure functional support requirements are accurately identified and reflected in the final SDS configuration.

C. CONTROL

> "Management control is the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's goals." [Ref. 18]

Management control of the site preparation process entails two separate but interdependent phases--the planning phase, and the control phase. During the planning phase, site preparation tasks are broken down into measurable increments

of work which can be related to a physical product or milestone, such as transaction/workload analysis for a particular section, configuration design, etc. In addition, to the extent possible, the plan being developed should identify the expected costs associated with each task and provide a description of the expected quality of any end product.

Once tasks have been identified and defined, a time schedule for completion must be developed. Several methods of depicting schedules are available, ranging from project schedules such as Gantt-charts which show calendar dates for project milestones (major tasks and critical minor tasks) to network analysis techniques such as PERT (Program Evaluation and Review Technique), CPM (Critical Path Method), or LOB (Line of Balance method), which show subgoals, or events, that must be completed in order to accomplish the whole project, the time required for the activities necessary for the attainment of each event, and the chronological sequence in which events must be completed in order to accomplish the whole project. Detailed information regarding such schedule planning methods is contained in Reference 19 through 21 of this thesis, as well as numerous other management books. While any of these methods is a viable alternative, at least one method should be included in SDS site preparation control planning to provide a basis against which actual accomplishments may be measured and evaluated.

The control phase entails the monitoring of activities to provide information regarding the following three areas of management concern:

1. Is the project going to be finished by the scheduled completion date?

2. Is the completed work going to meet the specificiations that were contemplated when the project was approved?

3. Is the work going to be done within the estimated cost? [Ref. 22]

Elements of an effective management control system in the site preparation process which must be established and defined include: (1) a method of monitoring the status of different tasks which will identify what is happening at any given point of time during the project; (2) a method of assessing the significance of what is happening, that is, a means of comparing current status with expected status; (3) a method of changing behavior if the need for doing so is indicated; and (4) a method of communicating and relating the three previous elements.

The first element of the control system, a method of monitoring status, could be attained through assigning specific responsibilities for tasks among team members about which they would be required to maintain current and accurate information throughout the project.

Development of a method of accessing the significance of current status would entail a requirement for the responsible individual to compare status with the project plan, to identify

any deviations and possible project impacts, and to notify specified personnel when preestablished impact thresholds had been breached.

Methods and authority to change behavior could be identified according to specified project impact thresholds. For example, a project team member might have the authority to require additional organizational resources, wuch as a specified amount of overtime, in order to achieve certain specific tasks within his scope of responsibility, but would not have the authority to acquire resources in tasks requiring interorganization support or SDS project level approval.

The final element of the control system is a method of communication between the elements and a means of coordinating the methods and efforts. In order to attain effective control and monitoring of site preparation activities, an effective communications system must be established to ensure timely feedback regarding activity status or problems, and to identify potential conflicts which may result from the various decisions being made throughout the site preparation process. The communication structure is an essential determinant of effectiveness and efficiency; thus, field managers should ensure that the methods by which information is to flow between participants in the site preparation process are clearly identified and understood by all responsible praties.

The SDS site preparation process will require development of communications structures involving the fcllowing types of communications:

1. communication internal to the project team;

2. communication between project team and the remaining internal organization;

3. communication between the project team (or organization) and other local support activities; and

4. communication between the project team (or organization) and the SDS Porject Office.

The communications structures should identify the information flow within the area of concern, including responsibility and authority of various participants. In addition, it may include definition of the reporting method to be utilized in the various communications activities--i.e. if and when meetings are to be held, who will attend, what information is to be provided by each participant, what delivery medium (i.e. written or oral) is to be utilized, etc.

The management approach utilized, whether it be the project management type recommended herein or another type, should address each of the fundamental management aspects described above. A method of evaluating the selected management approach is contained in Appendix M, which illustrates a checklist which could be used to analyze the adequacy of the planning, organizing, and control methods selected.

VIII. SITE PREPARATION AND THE IMPLEMENTATION PROCESS

While the responsibilities and requirements of field level site preparation are extensive, site preparation is only one area of concern to PASS field managers in the overall SDS implementation process. Similar anlaysis and coordination will be required in support of data conversion and procedural implementation of the SDS system. In addition, field managers will have responsibility for coordinating operator training efforts with the SDS project office, for educating internal users and external serviced activities regarding the changes to procedures, reporting requirements, and support capabilities which will result from the new system, and for assisting in operational testing of the SDS system upon installation.

While these areas are of concern in successful implementation of the SDS system, this thesis has focused on the site preparation process because it is an important element which is quite frequently underrated or overlooked when considering implementation activities and requirements. In addition, the site preparation process is of crucial concern to field managers for three major reasons: (1) Effective site preparation is essential to the successful installation and implementation of SDS support at the field activity level; (2) effective and timely completion of field level site preparation is critical

to the overall SDS Project Implementation schedule; and (3) the site preparation process is, in reality, the first opportunity for field managers to analyze the SDS support system in the context of the existing operating organization and physical facility and to fully comprehend the implications of SDS and the impacts the new system will have on the field level organizational structure and operational environment. In effect, the site preparation process provides the first realistic orientation to the new system, as well as the first major imvolvement of field managers in the overall implementation process.

The success of SDS ultimately depends upon how well the system is implemented at each field level site--and site preparation is a critical factor in achieving such success. This thesis has described a systematic approach to the site preparation process which could be utilized by PASS field level managers. While use of this particular approach is by no means mandatory, consideration of the concepts presented herein should assist field managers in developing an effective approach to the site preparation process.

APPENDIX A

FORMS/EVENTS TO BE REPLACED
BY AUTOMATED SUPPORT UNDER SDS

Release 1:

Form/Event	Title	Current Responsibility
NC 3052	Employees withholding Exemption listing	Disbursing
NC 3053	Allotment Authorization	Disbursing
NC 3057	Family Separation Allowance (FSA)	Svc Rec Maint
NC 3058A	FSA (Multiple)	Svc Rec Maint
NC 3060/61	Mil. Pay Order	Disbursing
NC 3062	Orders for Hazardous Duty or Special Duty	Svc Rec Maint
NC 3063	Overseas Station Allowance	Svc Rec Maint
NC 3064	Basic Allowance for Subsistance	Svc Rec Maint
NC 3065/65A	Leav Auth. Officer/Enlisted	Customer Svc
NC 3066	Uniform Allowance Claim	Customer Svc
NC 3067	Detaching Endorsement to Orders	Receipts/Transfers
NC 3068	Reporting Endorsement to Orders	Receipts/Transfers
NC 3069	Group Travel Listing	Receipts/Transfers

Form/Event	Title	Current Responsibility
NP 1070/601	Immediate Reenlistment Contract	Reenl/Seps
NP 1070/602	Record of Emergency Data	Customer Svc
NP 1070/606	Record of Unauthorized Absence	Discipline
NP 1070/607	Court Memorandum	Discipline
NP 1070/610	Record of Personnel Actions	Svc Rec Maint
NP 1070/621	Agreement to Extend Enlistment	Reenl/Seps
NP 1070/622	Assignment to and Extension of Active Duty	Reenl/Seps
Diaries		Personnel Accounting
Projected Assignment Notification		None

Release 2:

NC 3055	Military Pay Voucher	Disbursing
NC 3056	Military Payroll Money List	Disbursing
Passenger Transportation Reservations		Receipts/Transfers/ Travel
Government Transportation		Travel
Automated Travel Claims		Travel
Leave and Earnings Statements		Disbursing

Release 3:

No forms/events defined to date for replacement under Release 3.

APPENDIX B

LIST OF USER IDENTIFIED CANDIDATES FOR PRINTED REPORTS TO BE PRODUCED FROM THE LOCAL SDS DATA BASE

NAME OF REPORT	FREQUENCY OF REPORT
Officer Activity Locator Report -Alphabetic sequence -Alphabetic sequence by UIC -Rank by UIC	Monthly
Enlisted Activity Locator Report -Alphabetic sequence -Alphabetic sequence by UIC -Rate by UIC	Monthly
Officer Projected Rotation Date Within 6 months of expiration -PRD sequence -PRD sequence within UIC	Upon Request
Enlisted Projected Rotation Date Within 6 months of expiration -PRD sequence -PRD sequence within UIC	Upon Request
Enlisted Report of Active Duty Obligation and Projected Rotation Date -PRD sequence within UIC -EAOS sequence -EAOS sequence within UIC	Upon Request
Advancement Eligibility Report -TIR within Rate -TIR within Rate within UIC	Upon Request
Recall, Training Plans, Schedules, Watch, Quarters and Station Bills -UIC	Weekly or Upon Request
Local Address Listing -UIC	Monthly
Good Conduct Awards Eligibility Listing	Upon Request
Correspondence Course Completion Listing -UIC	Upon Request

NAME OF REPORT	FREQUENCY OF REPORT
Reelistment Eligibility Listing -UIC	Upon Request
BAQ, Commuted Rations Listing -UIC	Monthly
Service-Wide Examination Inventory/ Accountability	Upon Request
Status of Completion of Requirements for Advancement	Upon Request
Retention Statistics Report	Upon Request
Separations Statistics	Upon Request
Special/Unique Professional Qualifications -UIC	Upon Request
Adult Off-Duty Education Participation	Upon Request
Mobilization Requirements Listing	Upon Request
Personnel Historical File and Locator	Upon Request
Equal Opportunity Indicators	Upon Request
Total Local Payroll -UIC	Monthly
Entitlement to Special Pay and Incentive Pay	Upon Request
Commanding Officer's Leave Listing	Monthly
Direct Port Call Management Data	Upon Request
Government Transportation Request Accountability Data	Upon Request
Crew Member/Non-crew Member Report	Monthly
Federal Income Tax Withheld	Annually
Certification of Reenlistment Bonuses	Upon Request
Pay Vouchers	Upon Request

NAME OF REPORT	FREQUENCY OF REPORT
Human Resource Management Survey	Upon Request
Eligibility for Battle or Department Awards	Upon Request
Eligibility for Training Courses, Schools	Upon Request
Security, Personnel and Physical	Upon Request
Expiration dates of identification Cards Active/Inactive/Dependents	Upon Request
Changes to Allotments	Upon Request
Lapse/Due dates for Physical/Dental Exams and Vaccinations/Innoculations	Upon Request
Dates for Qualifications/Certifications -Divers -Welders -Non-Destruct Test Inspectors, -Examiners -Nuclear Propulsion	Upon Request
Sailing List	Upon Request
Embarked List	Upon Request
Debarked List	Upon Request

The following special form reports are also under consideration:

Enlisted Distribution and Verification Report	Monthly
Officer Distribution Control Report	Monthly
IRS W2 Form	Annually

APPENDIX C

SDS WORKFLOW ANALYSIS FORM

TRANSACTION TYPE	CURRENT FORMS USED	REPLACED UNDER SDS	CURRENT RESPONSIBILITY			PROPOSED (SDS) RESPONSIBILITY		
			PREP	REVIEW	AUTH	PREP	REVIEW	AUTH

Instructions:

1. Using information contained in Appendices A and B, identify and list each form and/or event currently used in processing each type of transaction.

2. Identify which currently-used forms/events will be replaced by terminal input under the SDS system by specifying the SDS Release Number under which the form or event will be replaced.

3. For each form/event of a given transaction type, identify and list which section(s) currently have responsibility for:

   a. Preparation of the form;

   b. Review of the form;

   c. Authorization of the form.

4. For each form of a given transaction type, identify and list the proposed section which will have responsibility under the SDS system for:

   a. Preparation of the form

   b. Review of the form;

   c. Authorization of the form.

APPENDIX D

TRANSACTION WORKLOAD ANALYSIS FORM

	DAILY VOLUME			WEEKLY VOLUME			MONTHLY VOLUME			ENTRY VOLUME			MANUAL PROCESSING TIME			MACHINE PROCESSING TIME			DAILY VOLUME VARIANCE		WEEKLY VOLUME VARIANCE						MONTHLY VOLUME VARIANCE				
NAME	L	N	H	L	N	H	L	N	H	MIN	NORM	MAX	MIN	NORM	MAX	MIN	NORM	MAX	AM	PM	M	T	W	TH	F	Pay day	1	2	3	4	Pay
TOTAL																															
AVG																															

SDS TRANSACTION TYPE_____

CURRENT FORM_____

SECTION_____

APPENDIX D

TRANSACTION WORKLOAD ANALYSIS QUESTIONNAIRE

Instructions: For each individual assigned to the section, answer the following questions:

DAILY, WEEKLY, MONTHLY VOLUME DATA

1. How often does the individual process this transaction? (Check One)

Daily _____ Weekly _____ Monthly _____

The answer to the above question determines which sections of the graph must be filled in:

Daily --- Daily Volume Section
Daily Volume Variance
Entry Volume
Manual Preparation Time
Machine Processing Time

Weekly -- Weekly Volume Section
Weekly Volume Variance
Entry Volume
Manual Preparation Time
Machine Processing Time

Monthly - Monthly Volume Section
Monthly Volume Variance
Entry Volume
Manual Preparation Time
Machine Processing Time

VOLUME DATA

2. What is the lowest number of this type of transaction processed by this individual during a work period?

_____ (Enter answer in "L" column of associated Volume section.)

3. What is the normal number of this type of transaction processed by this individual during a work period?

_____ (Enter answer in "N" column of associated Volume Section.)

4. What is the highest number of this type of transaction processed by this individual during a work period?

_____ (Enter answer in "H" column of associated Volume section.)

ENTRY VOLUME

5. How many entries are required to process this transaction type?

_____ Minimum (Enter answer in "MIN" column of Entry Volume)

_____ Normal (Enter answer in "NORM" column of Entry Volume)

_____ Maximum (Enter answer in "MAX" column of Entry Volume)

MANUAL PREPARATION TIME

6. Estimate the amount of time (in minutes) required to manually prepare information prior to typing:

_____ Minimum (Enter answer in "MIN" column of Manual Proc Time)

_____ Normal (Enter answer in "NORM" column of Manual Proc Time)

_____ Maximum (Enter answer in "MAX" column of Manual Proc Time)

MACHINE PROCESSING TIME

7. Estimate the time (in minutes) required to process this transaction at a typewriter.

_____ Minimum (Enter time required to process the least number of entries at a typewriter in "MIN" column of Machine Processing Time)

_____ Normal (Enter time required to process a normal number of entries at a typewriter in "NORM: column of Machine Processing Time)

_____Maximum (Enter time required to process the maximum number of entries at a typewriter in "MAX" column of Machine Processing Time)

VOLUME VARIANCE

8. How does the volume of this type of transaction vary according to the time of processing? Rate each time period as H, M, L (high volume, normal volume or low volume processed during this time period).

9. Is there a peak load occurrence time for this type of transaction? If so, what day of the week or week of the month does it occur? Indicate with the letters "PL" in the appropriate space.

APPENDIX E

SECTION TERMINAL ACCESS REQUIREMENTS

(METHOD 1)

Section_____ SDS Transaction Type_____

Form_____

NAME	L-MIN	L-NORM	L-MAX	N-MIN	N-NORM	N-MAX	H-MIN	H-NORM	H-MAX
TOTAL									
TERMINALS:									
8-HOUR WORK DAY									
10-HOUR WORK DAY									
12-HOUR WORK DAY									

Estimated number of Terminals Required _____

1. Estimate access requirements for each individual:

   Low volume x Minimum machine processing time = L-MIN

   Low volume X Normal machine processing = L-NORM

   ETC.

2. Total each column to give estimate section total access required at each volume/processing time combination.

3. Determine number of terminals required for each column total based on access available per terminal per workday length, i.e.:

   8 hours = column total divided by 480

   10 hours = column total divided by 600

   12 hours = column total divided by 720

   Etc.

4. Compare results, and based on knowledge of expected section operations/processing requirements, select the estimated number of terminals most likely to provide adequate support of this form. Enter in "Estimated Number of Terminals Required".

APPENDIX F

SECTION TERMINAL ACCESS REQUIREMENTS

(METHOD 2)

Section_____ SDS Transaction Type_____

Form_____

	L-MIN	L-NORM	L-MAX	N-MIN	N-NORM	N-MAX	H-MIN	H-NORM	H-MAX
TOTAL									
TERMINALS									
8-HOUR WORK DAY									
10-HOUR WORK DAY									
12-HOUR WORK DAY									

Estimated Number of Terminals Required_____

1. Using column totals and averages from Appendix D. Calculate section access requirements for each volume/processing combination:

Low total X Average Minimum machine processing time = L-MIN

Low total X Average Normal machine processing time = L-NORM

Low total X Average Maximum machine processing time = L-MAX

Etc.

2. Determine the number of terminals required for each column based on the access available per terminal per workday length:

8 hours = column total divided by 480

10 hours = colume total divided by 600

12 hours = column total divided by 720

Etc.

3. Compare results and, based on knowledge of expected section operation/processing requirements, select the estimated number of terminals most likely to provide adequate support for this form. Enter in "Estimated Number of Terminals Required".

APPENDIX G

TERMINAL ACCESS REQUIREMENTS ADJUSTMENT ANALYSIS

1. Does this form have a peak load terminal access requirement? (a time period when access volume is unusually high, i.e. payday) _____

2. Estimate the peak load access requirements for each processing time:

Peak load volume X Minimum processing time _____

Peak load volume X Normal processing time _____

Peak load volume X Maximum processing time _____

3. Calculate the peak load duration in minutes:

Number of Peak Load Workhours x 60 _____

4. Calculate the estimated number of terminals required to support peak load access requirements:

Peak load access requirements divided by Peak load duration:

PL-Min _____

PL-Norm _____

PL-Max _____

5. Does the Section Terminal Access Analysis indicate the section will have this number of terminals? _____ If not,

a. How many additional terminals would be required? _____

b. Will terminals be available in other sections which could be used to assist peak load processing? _____ If so, what sections/how many terminals available?

Section	Terminals
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Total terminals available from other sections _____?

c. Subtract section B estimate from section A estimate to estimate the total additional terminals required to support peak load processing in the section:

PL-MIN _____

PL-NORM _____

PL-MAX _____

6. Compare results and, based on knowledge of expected section operation/process requirements, select the estimated number of terminals most likely to provide adequate peak load support of this form.

7. Number of additional terminals required due to:

a. Physical facility constraints _____

b. Mission Support constraints (i.e. remote sites) _____

c. Other (specify) _____

d. Total additional terminals required due to operating constraints _____

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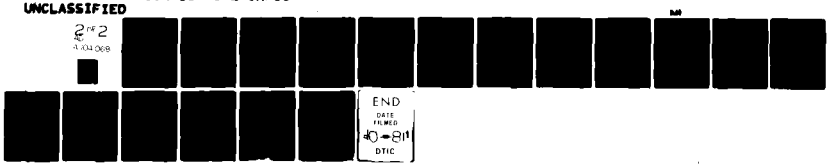

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APPENDIX H

SECTION TERMINAL/PRINTER REQUIREMENTS SUMMARY

TRANSACTION TYPE	FORM	ESTIMATED TERMINAL REQUIREMENTS	PEAK ADJUST	OTHER ADJUST	TOTAL TERMINAL REQUIREMENTS
TOTAL					

TOTAL PRINTER REQUIREMENTS _____

Section _____

Instructions: For each form/event processed by the section, complete the following:

1. Using the range of terminals identified in Appendix E or F, select the estimated number of terminals most likely to provide adequate support. Enter this estimate in the "Estimated Terminal Requirements" column.

2. Using the range of terminals identified in Appendix G, select the number of terminals most likely to be required to support peak load processing requirements. Enter the number in "Peak Load Adjust."

3. Using the information contained in Appendix G, enter the estimated number of terminals required to support this type of form caused by operating environment (Peak load or other factors).

4. Add each line (Estimated Terminal Requirements, Peak Load Adjust., and Other Adjust.) to obtain Total Terminal Requirements for the form.

5. Sum the Total Terminal Requirements column in order to obtain the total number of terminals required to support all forms processed by the section.

6. Divide the Section Total Terminal Requirements by three to obtain the Section Total Printer Requirements.

APPENDIX I

FACILITY TERMINAL/PRINTER REQUIREMENTS SUMMARY

SECTION	ESTIMATED TERMINAL REQUIREMENTS	PEAK ADJUST	OTHER ADJUST	TOTAL TERMINAL REQUIREMENTS	TOTAL PRINTER REQUIREMENTS
TOTAL RELEASE 1					
TOTAL RELEASE 2					

1. Complete the above form using section total information contained in Appendix H for each section.

APPENDIX J

CONFIGURATION REQUIREMENTS ANALYSIS FORM

1. DETERMINE FLOORSPACE REQUIRED BY EACH FUNCTIONAL AREA:

SECTION_____

a. Identify existing Equipment Floorspace Requirements

ITEM	NUMBER REQD	TOTAL FLOORSPACE REQD
Desks	_____	_____
Filing Cabinets	_____	_____
Supply Cabinets	_____	_____
Xerox	_____	_____
Other:	_____	_____
	_____	_____
	_____	_____

Total Floorspace required by existing equipment _____

b. Determine SDS support equipment floorspace requirements.

ITEM	NUMBER REQD	TOTAL FLOORSPACE REQD
CRT Terminals	_____	_____
Companion Printers	_____	_____
High Speed Printers	_____	_____

Total SDS support equipment floorspace required _____

c. Determine degradation capability:

1. If required, what is the number of terminals which could be placed on existing desks? _____

2. What additional floorspace is made available through this action? _____

3. What is the number of terminals which could be eliminated if personnel from this section were allowed access to a terminal in a nearby section or location? _____

4. What additional floorspace is made available through this action? _____

5. Total reduction in floorspace required by degrading capability? _____

6. Total floorspace required by degraded environment? _____

7. Would serious degradation of section mission capability be caused by such reductions? _____

2. DETERMINE FEASIBLE SECTION ASSIGNMENT ACCORDING TO FLOORSPACE AVAILABILITY.

Room Number _____ Total Floorspace Available _____

Sections which could feasibly be accommodated by this room:

1. _____
2. _____
3. _____
4. _____

3. DETERMINE ALTERNATIVE CONFIGURATIONS.

a. Utilizing forms developed in steps 1 and 2, draw various alternative configurations on separate floor plans. Then, for each floor plan drawn, evaluate the configuration according to the design constraint criteria and identify modifications to existing electrical/telecommunications support requirements.

APPENDIX K

CONFIGURATION ANALYSIS EVALUATION CHECKLIST

1. Electrical Requirements

a. Will proposed configurations require rearrangement of existing equipment to accommodate terminals/printers? _____

b. If rearrangement is required, will appropriate electrical outlets be avaliable to service the changed locations of existing equipment (i.e. typewriters, xerox, ID card equipment, etc.)? _____

c. Does an electrical outlet currently exist in each of the proposed terminal/printer locations? _____

Is it the proper voltage? _____

Is it a dedicated circuit? _____

2. Telecommunications Requirements

a. If rearrangement of existing equipment is required by this configuration, will telephones be in the correct locations to support the new equipment configuration? _____

If not, which telephone extensions must be changed:

Current Extension	Required Extension
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

b. Which concentrator circuit will connect each terminal/printer required for this configuration (maximum 11 per concentrator):

Terminal Printer Numbers	Concentrator
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

3. Environmental/Operating Requirements

a. Do proposed terminal/printer locations minimize noise disruption? _____

b. Does the location of the printers porvide space for storage of feeder paper? _____ Access for paper loading? _____ Access for maintenance? _____

c. Do locations enable efficient and safe traffic flow in and through the workspace? _____

d. Do the locations of terminals and printers minimize transit time for users? _____

4. Security Requirements:

a. Does the proposed configuration provide security of access to terminals and printers? _____

b. Does the proposed configuration ensure unauthorized personnel would not be able to view CRT displays and printer outputs? _____

5. Identify modifications to existing electrical an/or telecommunication support requirements and annotate the floor plan with the required information. Using evaluation checklist, note questions whose answers will entail some modification to existing capability.

6. Summarize the evaluation and number of terminals/printers required by the configuration.

a. Does this configuration meet all design constraints listed? _____

b. If not, have all modifications identified in the evaluation checklist been annotated on the associated floor plan? _____

c. What is the total number of terminals/printers identified in this configuration?

Terminals _____ Printers _____

APPENDIX L

SITE PREPARATION REQUIREMENTS SUMMARY

Room Number _____

Proposed Section _____

1. Equipment Requirements:

Desks	_____
Typewriters	_____
File Cabinets	_____
Supply Cabinets	_____
Xerox	_____
CRT Terminals	_____
Companion Printers	_____
High Speed Printer	_____
Telephones	_____

2. Modification Requirements:

a. Electrical

	110V	220V
Total Outlets	____	____
Current Outlets	___	____
Add'l Req'd	____	____

Total circuit modification required _____

b. Telecommunications Requirements

Telephone location/extension:

Current	Required
_____	_____
_____	_____
_____	_____

Concentrator connections:

Terminal/Printer	Concentrator
_____	_____
_____	_____
_____	_____
_____	_____

c. Other

(Specify) _____

(i.e. rearrangement of equipment, etc.)

Comments:

(For example--Will share terminal number _____ with section _____ for peak load processing)

APPENDIX M

MANAGEMENT APPROACH EVALUATION CHECKLIST

A. PLANNING

1. Does the approach plan address all tasks of the site preparation process:

a. Analyzing activity support requirements _____

b. Determining the amount of SDS support equipment required _____

c. Determining equipment allocation and configuration within the activity _____

d. Identifying required modifications and costs _____

e. Completing required modifications within cost and schedule constraints _____

f. Monitoring and controlling site preparation activities _____

g. Arranging and coordinating delivery and installation of SDS equipment _____

h. Acquiring supply support for the operational SDS system _____

2. Does the approach clearly describe required procedures for performing the required site preparation tasks delineated in question 1?

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

g. _____

h. _____

3. Does the approach describe procedures for establishing and maintaining liaison and coordination with external organizations, if required? _____

B. ORGANIZING

1. Does the approach describe an organization of personnel to be utilized in achieving site preparation requirements?

_____

2. Does this organization plan:

a. Designate specific personnel who will be assigned?

_____

b. Designate specific tasks and responsibilities to assigned personnel? _____

c. Indicate that assigned personnel will have sufficient knowledge and experience to adequately perform assigned tasks? _____

3. Does the organization plan clearly specify:

a. Responsibilities of all assigned personnel? _____

b. Each individual's scope of authority within the site preparation organization structure? _____

c. Each individual's scope of authority within the field level organization in conjunction with site preparation responsibilities? _____

d. Each individual's scope of authority when interacting with external local organizations regarding site preparation activities? _____

e. Each individual's scope of authority when interacting with the SDS Project Office regarding site preparation activities? _____

4. Does the plan clearly define the interface and operating relationships between:

a. Site preparation organization personnel? _____

b. Site preparation personnel and other functional personnel within the field level organization? _____

c. Site preparation personnel and external local support activities? _____

d. Site preparation personnel and the SDS Project Office? _____

C. CONTROL

1. Have site preparation tasks been broken down into measureable increments of work which can be related to a physical product or milestone? _____

2. Does the approach describe the methods to be utilized in monitoring progress and reporting deviations regarding:

a. Schedule? _____

b. Ability to meet specified support requirements? _____

c. Cost? _____

3. Does the approach describe the required information flows:

a. Within the site preparation organization? _____

b. Between site preparation personnel and the field level organization personnel? _____

c. Between site preparation personnel and local support activities? _____

d. Between site preparation personnel and the SDS Project Office? _____

4. Does the approach describe required reporting methods and media, and timing? _____

5. Will the described reporting system provide timely feedback and verifiable progress reports? _____

LIST OF REFERENCES

1. Department of the Navy, Pay/Personnel Administrative Support System PASS Consolidation Manual, OPNAVINST 1000.23, pp. 1-2, 19 December 1979.

2. Department of the Navy, Pay/Personnel Administrative Support System, PASS Management Plan, p. 4, 5 September 1980.

3. Department of the Navy, Deputy Chief of Naval Operations (MPT), Office of the Comptroller, PASS Phase II (SDS) Automated Data System Development Plan, p. A-2, March 1979.

4. Department of the Navy, Pay/Personnel Administrative Support System, PASS Consolidation Manual, p. 1, 19 December, 1979.

5. Department of the Navy, Pay/Personnel Administrative Support System, PASS Management Plan, p. 5, 5 September 1980.

6. Ibid., p. 3.

7. Ibid.

8. Naval Military Personnel Command, NMPC Document Number 99J100 FD-01A, PASS Phase II Source Data System (SDS) Functional Description, pp. 19-37, 25 August 1980.

9. Department of the Navy, Deputy Chief of Naval Operations (MPT), Office of the Comptroller, PASS Phase II (SDS) Telecommunications Sub-system Project Plan, p. 11-16, Undated.

10. Naval Military Personnel Command, Memorandum Letter NMPC-1633 LCK:bjt Ser 163/009-81, Subject: SDS Telecommunications Status, 9 January 1981.

11. Departmnet of the Navy, Deputy Chief of Naval Operations (MPT), Office of the Comptroller, PASS Phase II (SDS) Telecommunications Sub-system Project Plan, p. 11-16, Undated.

12. Department of the Navy, Pay/Personnel Administrative Support System, PASS Consolidation Manual, pp. 50-51, 19 December 1979.

13. Department of the Navy, Deputy Chief of Naval Operations (MPT), Office of the Comptroller, PASS Phase II (SDS) Automated Data System Development Plan, p. A-2, March 1979.

14. Turban, E. and Meredith, J. R., Fundamentals of Management Science, p. 15, Business Publications, 1977.

15. Robbins, S. P., Managing Organizational Conflict, A Non-Traditional Approach, p. 5, Prentice Hall, 1974.

16. Cleland, D. I. and King, W. R., Systems Analysis and Project Management, 2d ed., pp. 198-201, McGraw-Hill, 1975.

17. Robbins, S., Op. Cit., p. 6.

18. Anthony, R. N. and Dearden, J., Management Control Systems Texts and Cases, 3d ed., p. 8, Richard D. Irwin, 1976.

19. Ibid., p. 399.

20. Cleland, D. I. and King, W. R., Op. Cit., pp. 342-363.

21. Hajek, V. G., Management of Engineering Projects, pp. 49, 55, 125-143, McGraw-Hill, 1977.

22. Anthony, R. N. and Dearden, J., Op. Cit., p. 741.

BIBLIOGRAPHY

Adams, D. L., "But Can You Get It Through the Door?", Controlling the Computer, Management of EDP Problems, Selected Reprints from AMA Periodicals, American Management Association, 1967.

Canning, R. G., Installing Electronic Data Processing Systems, Wiley, 1957.

Hice, G. F., Turner, W. S. and Cashwell, L. F., System Development Methodology, North-Holland, 1974.

Matthews, D. Q., The Design of the Managenet Information System, Mason/Charter, 1976

Murdick, R. G. and Ross, J. E., Information Systems for Modern Management, Prentice-Hall, 1977

Rubin, M. L., Handbook of Data Processing Management, V. 1, Introduction to the System Life Cycle, Brandom/Systems, 1970

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